THE RUBBER AGE

MAY 10, 1921 VOL. IX. NO. 3

Member of the Associated Business Papers, Inc.

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THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*

HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

SUBSCRIPTION PRICE: TWO DOLLARS PER YEAR. SINGLE COPIES TEN CENTS. CANADA, TWO AND A HALF DOLLARS PER YEAR. FOREIGN, THREE DOLLARS A YEAR.

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ISSUED ON THE 10th AND 25th OF EACH MONTH. FORMS CLOSE FIVE DAYS PREVIOUSLY. ENTERED AS SECOND-CLASS MATTER JUNE 10, 1920, AT THE POST OFFICE AT HIGHLAND, N. Y., UNDER THE ACT OF MARCH 3, 1879.

CABLE ADDRESS
"REDSONDER, NEW YORK"
LIEBER'S
A. B. C. 5th EDITION AND
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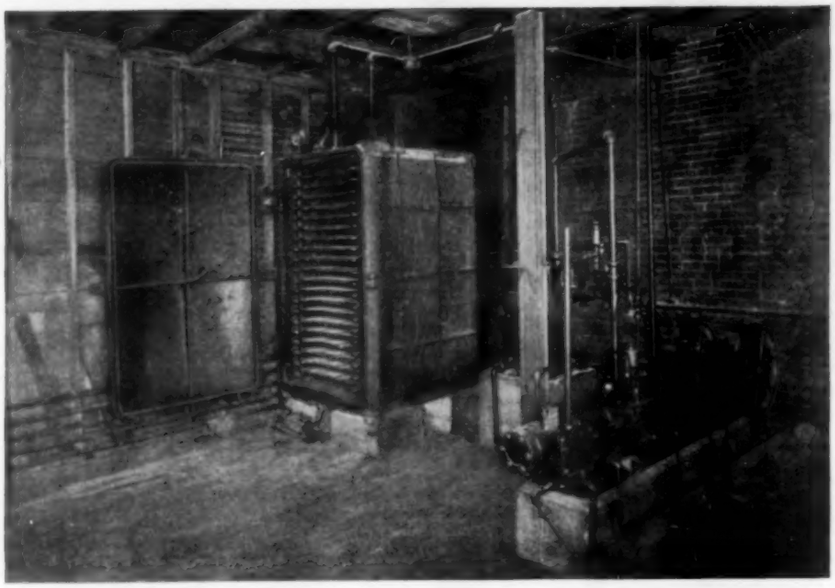

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THE RUBBER AGE

G. M. SANGSTER, JR., MANAGING EDITOR
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VOL. IX MAY 10, 1921 No. 3

Antimony Sulfuret, Its Manufacture and Use

By D. A. Shirk

The Rare Metal Products Co., Belleville, N. J.

Part I. General Discussion

In the rubber industry, "antimony sulfuret" (often referred to as "antimony" or "sulfuret") is the trade name applied to precipitated sulfides of antimony containing various percentages of free sulfur and adulterants. The sulfides are generally present as pentasulfide or oxysulfide. (There are those who maintain that the so-called oxysulfide is, in fact, the trisulfide. We leave this discussion to a later paper.) With certain exceptions, manufacturers use the words "golden" and "crimson" to indicate pentasulfide and oxysulfide respectively, and the word "golden-crimson" when both are present. We shall use herein this nomenclature.

In order to obtain the best results with antimony the rubber chemist ought to have some knowledge of the general outline of the processes of its manufacture so that he can know what impurities to look for, how to properly draw up specifications and how to effect a practical system of checking the quality. Aside from the quality there is the matter of price. A buyer cannot purchase to the best advantage without a fair knowledge of the article he is buying. We will, therefore, present a brief outline of most of the processes used in the manufacture of antimony sulfuret.

Golden antimony is obtained from the reaction between either calcium sulfantimonate, $Ca_3(SbS_4)_2$ or sodium sulfantimonate, Na_3SbS_4 and either sulfuric, sulfurous or hydrochloric acid. It is evident that when sulfuric acid is employed to precipitate from the calcium solution that calcium sulfate is also precipitated. This calcium sulfate being quite insoluble remains in the final product and dries to $CaSO_4\ 2H_2O$. The free acid is generally washed out by decantation or filtering, although it is sometimes neutralized with an excess of calcium carbonate or calcium hydroxide. Irregularities in the preparation of the salt solutions, concentrations, temperatures, washing, drying and grinding will result in products which, although they may be superficially similar will give many different results under vulcanization.

Crimson antimony is commercially produced by the reaction between sodium or calcium thiosulfate and a solution of antimony trichloride in hydrochloric acid, or a suspension of antimony oxychloride in an acid solution. The calcium salt is not as stable as the sodium salt and where it is used there is often present in the finished product certain quantities of calcium sulfite. This product is always tested for acid and should be tested for chlorides as well. It is well known that good qualities of both crimson and golden antimony will sometimes after long standing give a faintly acid reaction due to the formation of a very small amount of sulfur dioxide. This should not be confused with the presence of traces of hydrochloric acid or antimony chloride, the responsibility for which must be born by the producer.

The color of antimony, or rather its ability to retain its color at elevated temperatures, is of important consideration. Contrary to the popular belief a reliable grade of golden antimony, or pentasulfide, does not, under vulcanization, decompose to Sb_2S_3 and sulfur. The physical stability of color is an indication of the chemical stability of the pentasulfide. When golden antimony is subjected to elevated temperatures it does not yield any free sulfur until its color changes. As the color changes to brown certain amounts of free sulfur appear and finally when the color becomes black the amount of free sulfur yielded is about equivalent to the amount calculated upon the theoretical decomposition of the pentasulfide to the trisulfide. It becomes evident, therefore, that to use a golden that just turned brown under cure would result in a situation where the total amount of free sulfur acting would be very indefinite.

Antimony sulfuret when of a proper grade and properly used has three distinct advantages. First, it is an accelerator. Contrary to a statement recently made in a rubber journal of wide circulation and likewise shared by quite a number of rubber chemists, antimony sulfuret in a compound will enable the maximum cure to be obtained at a given temperature and time with the use of less free sulfur. This presents the great advantage of reducing the amount of uncombined free sulfur in the vulcanized product. This in itself gives one explanation of the second advantage, namely, of good aging. The superior aging quality of a good red tube is quite generally recognized.

A third advantage is the increased sales value of a bright clean orange or red stock over a blooming grey stock. Some manufacturers use antimony because the free sulfur it carries is generally all precipitated and hence in a much finer state of division than the ordinary flour sulfur. Some manufacturers lay particular stress upon the fact that with antimony they can obtain a stock of much softer "feel" than with any other compounding ingredient.

Prior to September 1914 there was in the United States only one manufacturer of antimony sulfuret in quantity. England and France had furnished the major part of the antimony used in this country, although just at that time Germany was beginning to make serious inroads in the business of their other European competitors.

When the war shut off the European supply American manufacturers met the situation with products which, while at first not wholly satisfactory, represent today the very best products that can be found in any market.

Some Points on the Quality of Antimony

There are not many differences between a pure golden or crimson antimony aside from color and price. The crimson is considerably more expensive but imparts to the stock a deep red color that the pentasulfide will not give. On the other hand many prefer the golden shade when it is clean and bright. The chemist should be particular that the antimony retains the brilliancy of its color under his particular conditions of vulcanization for the reasons given above. The best texture cannot be obtained where there is any considerable quantity of $CaSO_4\ 2H_2O$. This is largely due to the large particle size of the $CaSO_4\ 2H_2O$. Every rubber chemist wishing to be sure of his ground on antimony should make a careful study of particle size and agglomeration. When buying, everything else being the same, the percentage of anti-

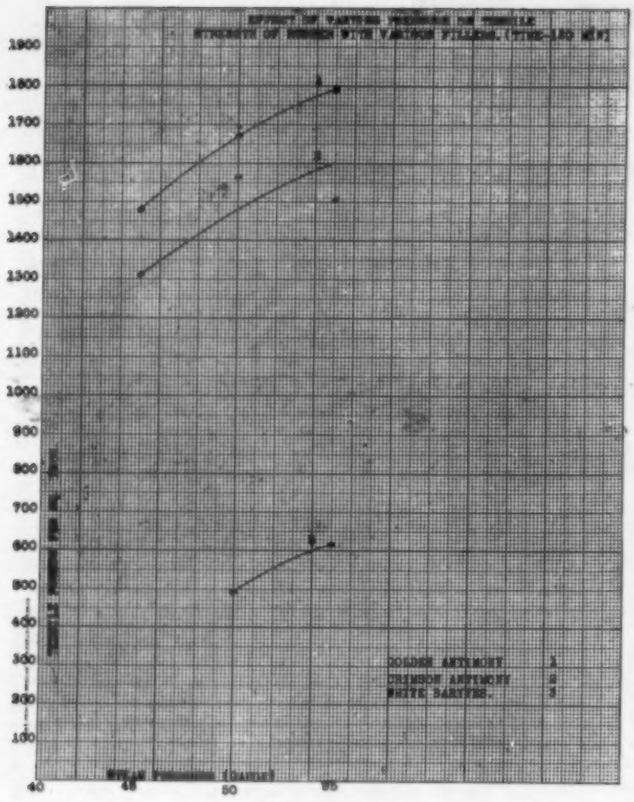


CHART 1

mony sulfide present should determine the price. Technical cooperation between manufacturer and consumer by using the same methods of analyses and tests will eliminate a great many difficulties generally experienced by the user.

It is the belief of the writer that most of the uncertainty and distress in the use of antimony, which has so often been referred to as the rubber chemists' nightmare, will permanently pass when the trade in general accepts as a standard an acid free, pure, stable pentasulfide, of a specified state of division, carrying a specified percentage of free sulfur.

Part II. The Effect of the Sulfides of Antimony on the Vulcanization of Rubber

It has already been observed and pointed out that antimony sulfuret of itself is not a vulcanizing agent but that any effect produced on the physical properties of rubber when compounded and cured with antimony sulfuret is due entirely to the "free" sulfur which the sulfuret contains. While it is undoubtedly true that the actual vulcanization is brought about by the free sulfur this observation has been often misinterpreted and misconstrued in the current literature of the rubber trade; so that the idea often conveyed is; that aside from the coloring properties of the antimony sulfides, there are no properties which advantageously effect the vulcanization of rubber.

It is the purpose of this investigation to show, that although the antimony sulfides alone will not vulcanize rubber, they will when incorporated with a rubber-sulfur mixture, produce a maximum tensile strength in a shorter time and with a lower ration of free sulfur to rubber than it is possible to obtain when an inert filler is used instead of the antimony sulfides or when a simple rubber and sulfur mixture is employed.

In making this investigation the following precautions were considered important:

1. A uniform grade of rubber should be used for all tests. To ensure this the rubber was all taken from one bale of "first latex".

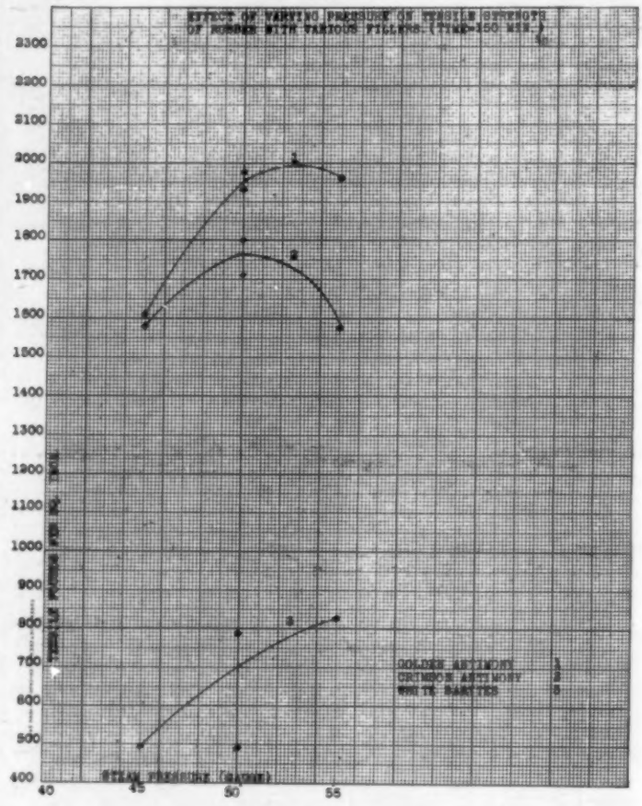


CHART 2

2. The batch of rubber milled should be of sufficient size to establish the findings on a practical working basis rather than merely on an experimental basis.

3. All of the rubber stock should be aged at least twenty-four hours before sheeting.

TABLE I

Time of Cure Minutes.	Steam Press. Lbs. per sq. inch.	Corresponding Temp. °F.	No. 1				No. 2				No. 3			
			No. of Tests.	Stretch from one inch.	Tensile Strength Lbs. per sq. inch.	Set.	No. of Tests	Stretch from one inch.	Tensile Strength Lbs. per sq. inch.	Set.	No. of Tests	Stretch from one inch.	Tensile Strength Lbs. per sq. inch.	Set.
120	45	292	2	8.7	1483		2	9.1	1308		Undercured			
150	45	292	2	8.9	1610	5/32	2	9.4	1580	5/32	2	11	495	5/16
120	45	292	1	8.7	1500	5/32	2	9.4	1555	5/32	2	11.2	460	3/8
120	50	297	2	8.6	1670	5/32	2	9.2	1565	5/32	2	10.6	492	5/16
150	50	297	2	9.1	1978	5/32	2	9.5	1710	5/32	1	10.0	490	1/4
120	55	302	2	8.9	1792	5/32	2	9.2	1505	5/32	2	11.0	619	1/4
150	55	302	2	9.1	1960	5/32	2	9.5	1578	5/32	2	11.0	829	7/32

TABLE II

Time of Cure	No. 1				No. 2				No. 3			
	No. of Tests	Stretch from one inch.	Tensile Strength Lbs. per sq. inch.	Set.	No. of Tests	Stretch from one inch.	Tensile Strength Lbs. per sq. inch.	Set.	No. of Tests	Stretch from one inch.	Tensile Strength Lbs. per sq. inch.	Set.
90	2	8.9	1695	5/32	2	9.3	1500	3/16		Undercured.		
105	2	9.0	1818	5/32	2	9.2	1600	5/32		Undercured.		
120	3	8.9	1890	3/16	3	9.4	1800	3/16	2	11.1	593	5/16
135	2	8.9	1900	5/32	2	9.4	1885			No Test		
150	2	8.9	1935	5/32	3	9.3	1800	3/16	3	11.1	788	9/32
150	3	8.8	2090	5/32	4	9.4	2010	3/16		No Test		
165	4	8.9	2038	5/32	2	9.7	2172	3/16		No Test		
180	2	9.2	1990	3/16	2	9.5	1945	3/16	3	11.3	953	1/4
180	4	9.0	2131	5/32	4	9.7	2120	5/32		No Test		
210	2	9.5	2165	3/16	2	9.8	1935	3/16	3	11.5	1140	7/32
240	2	9.0	2168	5/32	2	9.6	1892	3/16	3	10.8	977	3/16

A graphical representation of the tensile strength from the above tables the variation produced by curing at various pressures for two and two and when the pressure is held constant and is taken from Table No. 2. is shown. Chart No. 1 and No. 2 are taken from Table No. 1 and show one half hours respectively. Chart No. 3 shows the effect of time of cure

4. More than ordinary care should be taken in weighing and checking the compounds.

5. Milling of the rubber should be as uniform as is consistent with factory operation.

With these points in mind the following compound mixtures were prepared.

No. 1. 25 pounds first latex.
5.25 pounds antimony pentasulfide.
1.00 pound "free" sulfur.

No. 2. 25 pounds first latex.
5.25 pounds antimony trisulfide.
1.00 pound free sulfur.

No. 3. 25 pounds first latex.
7.2 pounds white barytes.
1.00 pound free sulfur.

The specific gravity of the barytes is 4.4 so that the 7.2 pounds replaces the same volume as the 5.25 pounds of antimony pentasulfide sp. gr. = 3.2.

The mixed rubber was then allowed to set for twenty-four hours and sheeted to 3/32 inch sheets. Press cures were made on three plys of this stock under the conditions shown in Table I.

The pressure was then held as a constant at 50 lbs. per square inch (Temp. 297° F.) and the time of cure varied from 90 to 240 minutes with the results shown in Table II.

Conclusion

1. It is shown that both the trisulfide and the pentasulfide of antimony assist materially in the vulcanization of rubber. So that when either of these is compounded in a rubber-sulfur mixture a higher tensile strength can be obtained
   (a) In a shorter time or at a lower temperature.
   (b) And with a lower ration of free sulfur to rubber than can be obtained when an inert filler is used instead of the antimony sulfides.
2. It is also shown that in this accelerating action that the pentasulfide is more efficient than the trisulfide.

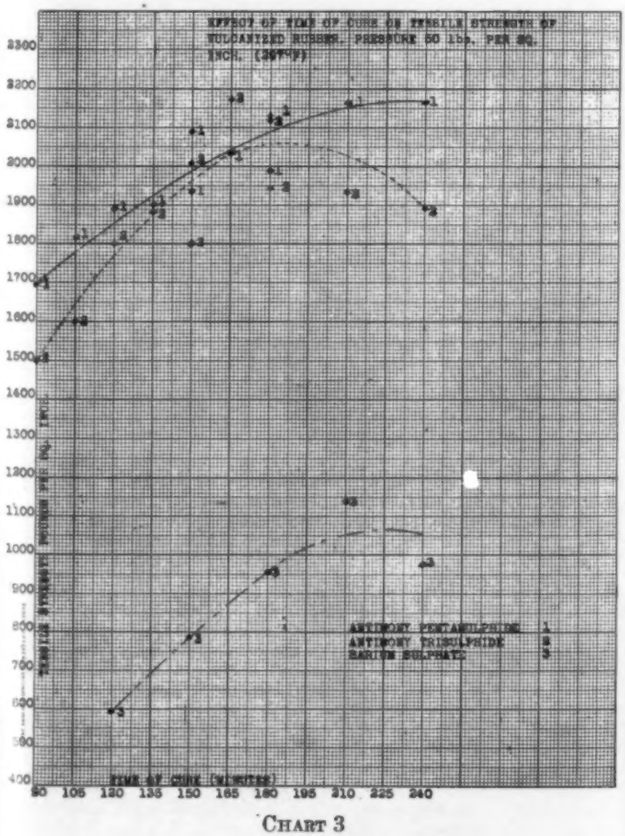

EFFECT OF TIME OF CURE ON TENSILE STRENGTH OF VULCANIZED RUBBER. PRESSURE 50 lbs. PER SQ. INCH. (297°F)
ANTIMONY PENTASULFIDE 1
ANTIMONY TRISULPHIDE 2
BARIUM SULPHATE 3
TIME OF CURE (MINUTES)
90 105 120 135 150 165 180 195 210 225 240

CHART 3

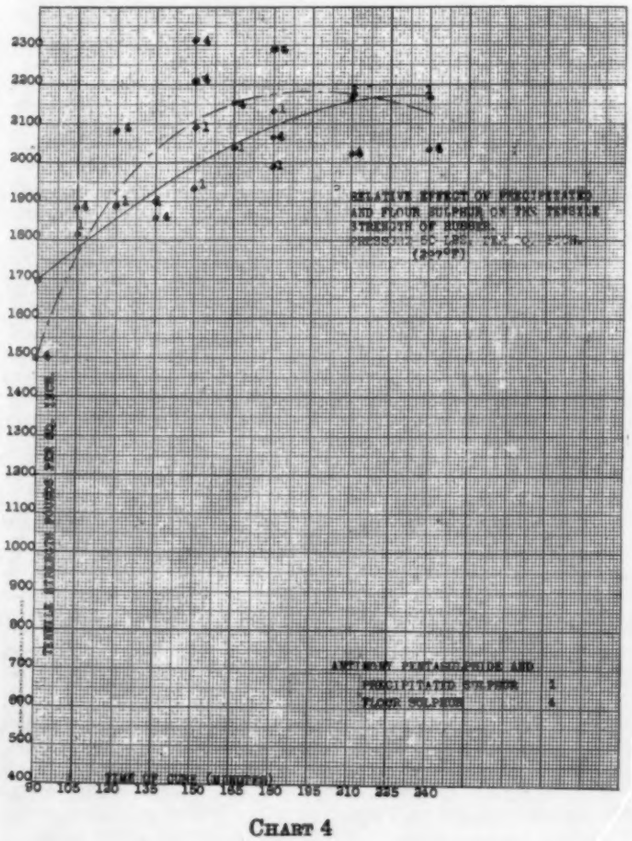

RELATIVE EFFECT ON PRECIPITATED AND FLOUR SULPHUR ON THE TENSILE STRENGTH OF RUBBER.
ANTIMONY PENTASULPHIDE AND PRECIPITATED SULPHUR 5
FLOUR SULPHUR 6
TIME OF CURE (MINUTES)
90 105 120 135 150 165 180 195 210 225 240

CHART 4

TABLE III

		No. 1				No. 4			
Time of Cure—Minutes	Steam Press. Lbs. per sq. in.	No. of Tests	Stretch from one in.	Tensile Strength Lbs. per sq. in.	Set	No. of Tests.	Stretch from one in.	Tensile Strength Lbs. per Sq. inch.	Set.
90	50	2	8.9	1695	5/32	2	8.7	1510	5/32
105	50	2	9.0	1818	5/32	2	8.7	1883	5/32
120	50	3	8.9	1890	3/16	3	9.2	2085	5/32
135	50	2	8.9	1900	5/32	2	8.8	1858	5/32
150	50	2	8.9	1935	5/32	2	9.2	2210	5/32
150	50	3	8.8	2090	5/32	3	9.3	2313	3/16
165	50	4	8.9	2038	5/32	3	9.2	2152	5/32
180	50	2	9.2	1990	3/16	2	9.3	2065	3/16
180	50	4	9.0	2131	5/32	3	9.3	2290	5/32
210	50	2	9.5	2165	3/16	3	9.3	2020	5/32
240	50	2	9.0	2168	5/32	2	9.0	2032	5/32

A graphical representation of the tensile strength data of the above table is found in Chart 4.

Part III. Relative Effect of Sulfur Co-precipitated with Antimony Pentasulfide and Flour Sulfur Added to Antimony Pentasulfide

There is a common opinion among certain rubber technologists that any advantage which might be attributed to the use of antimony sulfuret in the vulcanization of rubber is due entirely to the colloidal nature of the sulfur which is co-precipitated with the antimony sulfides. It is quite obvious that this sulfur is in a much finer state of division than the commercial grades of flour sulfur and that it is also more uniformly mixed with the antimony sulfides.

However, the following tests show that when antimony pentasulfide is incorporated with a mixture of rubber and ordinary flour sulfur that a higher tensile strength is obtained in a shorter time and with a lower ratio of sulfur to rubber than it is possible to obtain with the rubber and sulfur alone. They also show that flour sulfur when used with antimony pentasulfide produces at least a high tensile strength in a rubber compound as is produced with the same percentage of precipitated sulfur.

The data contained in Part 3 of this discussion was obtained at the same time and under the same conditions as the data of Part 2.

Compound No. 1 of Part 3 is identical to No. 1 of Part 2.

Compound No. 1: The antimony pentasulfide used in this compound was so adjusted that it contained 16 per cent of free sulfur which had been co-precipitated with the antimony pentasulfide.

The compound consisted of:

25 pounds first latex.
5.25 pounds antimony pentasulfide.
1.00 pounds free sulfur (precipitated).

Compound No. 4: This antimony pentasulfide contained only .94 per cent free sulfur. The compound consisted of:

25 pounds first latex.
5.25 pounds antimony pentasulfide.
.05 pounds free sulfur (precipitated)
.95 pounds free sulfur (flour).

The rubber was then milled, sheeted and tested as described in Part II.

The results of the tests are shown in Table III.

Conclusion

It is shown that the acceleration of vulcanization when antimony pentasulfide is used is not due to the colloidal nature of the free sulfur contained by the pentasulfide.

The use of commercial flour sulfur with antimony pentasulfide gives results at least equal to those obtained by the use of colloidal sulfur co-precipitated with the antimony pentasulfide.

Recent Books of Interest to the Trade

"RUBBER GOODS MANUFACTURE". By "Factory Manager". Maclaren & Sons, Limited, London, 1920. Cloth, illustrated, 496 pages, 6 x 9½ inches.

This work appeared originally in a series of articles in *The India Rubber Journal*, London, and is interesting throughout its twenty-eight chapters. The first chapters of the volume discuss factory arrangements, machinery and various essential departments. The various processes through which the rubber passes from its crude state to the finished product are interestingly described as are the processes of manufacture of numerous articles made from rubber. The concluding chapters discuss the details of factory management as applied to the rubber industry together with examples of estimating costs. A complete index concludes the book.

The volume is well bound and is profusely illustrated throughout. Inasmuch as the book treats of the methods in vogue in English rubber factories there will be a number of points found which are at variance with American methods.

"RUBBER, RESINS, PAINTS AND VARNISHES." By R. S. Morrell, M. A., PhD, F. I. C. and A. de Waele, A. I. C. D. Van Nostrand Company, New York, 1920. Cloth, illustrated, 236 pages, 5¼ x 8-5/16, $4.00.

This volume contains a summary of the properties of paints and varnishes together with those of their components and in addition a description of principles in accordance with which they are manufactured. Of particular interest to the members of the rubber industry is the initial chapter on "The Rubber Hydrocarbons". This chapter opens with a general discussion of the nature and properties of rubber, both physical and chemical, and then proceeds with a review of the manufacture of rubber articles, vulcanization, rubber substitutes, diseases and pests of the tree, and synthetic rubber. The other chapters discuss drying oils; resins and pitches; pigments and paints; linoleum, cork carpet and floorcloth and varnishes.

The book is well bound and illustrated and is well worth the consideration of the reader who is interested in such subjects as are to be found within its covers.

The Golden Year of Goodrich

The B. F. Goodrich Co. has recently issued an exceedingly interesting booklet commerating its fiftieth anniversary. This booklet, which is worthy of attention throughout its 46 pages, traces the history of the company and the development of the industry as a whole. The importance of rubber in industry and transportation is discussed and in addition the story of the firm's beginnings, growth and present-day activities are interestingly told. The make-up of the booklet is exceeedingly attractive and contains numerous drawings in color throughout. In addition to these there are reproduced liknesses of the company's three presidents—Dr. B. F. Goodrich, its founder; Col. George T. Perkins and B. F. Work, the present chief executive. A double-page spread in color depicting "The Importance of Rubber" and four other page illustrations typifying the four elements earth, air fire and water and the application of rubber to the conquering of each also serve to enhance the general attractiveness of the booklet.

Gaining the Confidence of Employes

By Frank V. Faulhaber

In order to attain results an organization must first gain the confidence of its employes. This statement which has been often repeated has yet to invite contradiction. Many plans for the improvement of industrial conditions have been put into effect by large companies but the results have not always been as anticipated. The reason that some of these plans failed was simply due to the fact that they lacked a sincere purpose. Innovations such as lunch-rooms, when not backed by proper management, seemed to the observant employe but shams, and therefore "made no hit" with him, entailing for the employer, as the latter learned to his chagrin, that much unnecessary expense.

Let us particularize. The writer, while recently investigating conditions in a factory, noticed something in connection with the plant-restaurant which made a decided impression upon him. Tacked up on nearly every post was a notice reading:

WARNING!

ALL EMPLOYES MUST BE AT THEIR RESPECTIVE POSITIONS WHEN THE 12.30 WHISTLE BLOWS. FAILURE TO OBEY THIS RULING MEANS PROMPT DISMISSAL

And the employer who had sponsored the plant-restaurant wondered why it did not attract as many employes as he had expected!

Lack of Harmony

The surroundings of this restaurant simply did not harmonize with its apparent purpose. At the beginning it received patronage from a good many of the employes. Gradually they began to drop away until the employer was satisfied a smaller corps of people were required for its management. Instead of making an effort to trace the reason for the lack of patronage, he started to curtail expenses. Altogether he has lost all faith in welfare movements. He has failed to win the confidence of his employes, production in the factory has not been up to standard, and the manager responsible for results has recently been superseded by another.

Similar illuminating examples might be cited but for the present one will suffice. To make for greater production the employer must get closer to the employe. In other words, he must gain the good will of his workers.

The management of one rubber factory has made decided progress in its field simply because it had a true perspective of industrial requirements. Everything connected with the welfare plans that this management sponsors, is consistent. They show that they are with the workman by their sincere efforts.

Whenever a man is ill an investigator is sent to his home to learn the nature of his illness, find out how long he will be detained from work, and secure the best medical attention for him, the latter at the expense of the company if the man is financially embarrassed.

If the conditions warrant a short vacation to bring an employe back to health, arrangements are made for this at the company's expense, meanwhile his family is cared for. You can be assured that when that employe returns to his position he is going to give his best without the need of prompting.

Eliminating Lateness

One large concern never docks its employes for tardiness without first learning the reason. Oftentimes there are excellent reasons for an employe coming late. If the tardiness was warranted through sickness or something beyond the control of the employe he is excused. Against this policy, however, if a workman shows he is tardy repeatedly through unjustifiable reasons he is dismissed, as production demands punctual attendance. Tardiness in this factory, it must be stated, has been reduced to a minimum. Reacting to the spirit of the management the employes co-operate, putting forth their best efforts, which has resulted in better and greater production.

During the past few months the rubber industry, in company with many others, has been at a low ebb. The companies which closed the doors of their factories will experience difficulty in re-organizing their forces. The man who is thrown out of a job, if he is of an aggressive nature, is not likely to await the re-opening of the factory that laid him off. If he is at all skilled he is sure to secure another position. For this reason many companies found out that they erred in shutting down entirely. In many cases they had to build a complete organization again, often lacking the team-work which their former forces possessed. In this way production was retarded and expenses unnecessarily increased. Many concerns whose managements have analyzed conditions realize this only too well and in order to eliminate such a possibility they run their plants on a part-time schedule.

Reducing Labor Turnover

Reducing labor turnover to a minimum is a task that has engaged the efforts of many close students of economy. The concern that has to hire and fire men repeatedly runs up expenses and cuts down production. First there is the matter of careful selection. If a man is put on to a job for which he is unfitted, he will eventually be dismissed, to make way for another and the new man must be instructed all over again, which incidentally involves the time of others.

As one successful executive observed, "It is meet that you avoid installing any undesirables, but at the same time one can't be too strict. You may lose some applicants who would prove worth-while employes." He knew whereof he spoke, for he has been interviewing prospective employes for many years.

This man possessed the key to proper interviewing. He knew how to place himself in the applicant's place and his first object was to obviate any possible discomfort experienced by the other. Once he gained the man's confidence it was easy to learn his capabilities to a degree. If he indicated that he was unfitted for a position in his organization it was easy for the executive to eliminate him.

Proper Instruction Esssential

There will always be some concerns of course that simply install a man at some position and then leave him to shift for himself. No policy is unwiser. An incident that occurred some time ago in a factory will bear out this statement. A young lad, who had never before worked in a factory, was put to work on a machine, and left to himself after a few preliminary instructions. The first day he did well and his work was up to requirements, both in point of quality and quantity. As it was later learned, the boy had been told by his foreman on Friday night that the following day it was necessary to clean his machine. "Get some waste tomorrow", he ordered, "and be sure the machine is clean before you quit."

The novice was accorded no further instruction. This is a thing the foreman should not have neglected. Instead the boy was left by himself when cleaning the machine. After he had removed the objectionable dust from some of the workings, he started his machine, at the same time resuming the cleaning. Some of the waste became entangled in the machine, the hand that grasped it was drawn into the machinery and was mangled to such an extent that the amputation of two fingers was necessary.

What followed was a suit against the company in which the boy received several thousand dollars. All this was the result of gross neglect. The company, it might be added, exercises more care with new employes. It has been burned once.

The foregoing is a representative case. New employes should always be shown everything connected with the operation of the machines at which they work. Many employes who become discouraged with the work before them often quit their jobs but this can be avoided if efforts are made to make things more easy and more agreeable for them at the start. The new man is not familiar with his surroundings. Sometimes he does not care but sometimes he does and if an individual is installed like a mechanical unit he is not likely to exhibit much interest in his duties.

The wise executive realizes only too well the position of the new employe. The writer recently witnessed an interesting case in one of the departments of a large corporation. During the course of a conversation an employe came up to tell his superior he thought one of the new men was sufficiently proficient and required no further instructions or watching. "That's all right," the executive nodded. "You stay with him; if necessary a whole week. Tell him everything I told you, and keep an eye on him until he is acquainted with the entire room. We've lost too many fellows because they thought they were lost and forgotten."

How many employes quit their positions for some minor, insignificant reason? An employment manager might attempt to answer and he would likely be wrong. Executives who are constantly on the alert sometimes try to ascertain the reasons why their employes quit. The writer has knowledge of one foreman whose policy it is to visist the homes of employes who fail to show up Often a valuable man is in this way won back to his department.

Another factor that contributes to the unrest of employes is the minor executive who tries to apply his authority too generously. The man who is in charge of a department must be held within certain limitations. If he is permitted to let his personal likes and dislikes override his better judgement he is more of an encumbrance than a furtherance in the employer's object.

The corporation whose payroll harbors the names of minor executives who are constantly exerting their authority and are not impartial should by all means remove them as soon as possible if the desired production is to be maintained. No organization can be a success unless its minor executives gain the good will of the employes. The production of too many good factories has been held down owing to men who held those under them in a constant state of anxiety.

All of which brings the writer to a statement made at the head of this article regarding the winning of the confidence of employes. That is the one formula relative to co-operation between employes and employer. As one congenial executive confided with a smile, "When you once get your men to say, 'Hello' to you in a friendly way, showing they are glad to see you, you need have no fear of labor troubles."

American Rubber Goods in Argentina

Like most other lines the American rubber industry greatly increased its export business with Latin-America during the war perioc This was not confined to any particular branch of the industry; it applied to druggists', hospital and mechanical supplies just as well as to automobile tires; the percentage of increase varied according to the extent of local usage and consumption, but not a little to the aggressiveness of the sales effort made. And today each branch is feeling the effect of the renewal of competition from Europe.

Prior to the war, and for the purposes of drawing normal conclusions that period should perhaps best be considered, the Latin-American trade was largely in the hands of Great Britain, Germany, France and Italy. For the five year period immediately preceeding the war the United States furnished only about five per cent of the motor tires for the Argentine, perhaps the best market in all South America. What was true of Argentina was virtually true of all the other countries, in other rubber goods as well as tires.

The Effect of the War

War imposed conditions wrought a change in the tire situation in Argentina. Motor consignments from Europe were automatically shut off once the struggle at arms got well under way. America was left as the one source of supply. During the five-year period 1910-14 only 15,623 cars were imported, divided: 6,057 French, 3,420 American, 1,975 German, 152 Italian, 919 Belgian and 1,344 British. But during the years 1915-18, of 24,733 cars imported more than 24,000 of them came from the United States. Now approximately eighty per cent. of the cars in Argentina are of American manufacture.

This condition has had the effect quite naturally of boosting tremendously the sales of American tires in Argentina. For instance the Argentinian imports of tires for the five years preceding the war aggregated 3,690,318 kilos, of which the United States supplied only 175,904 kilos. But in 1918 American tire manufacturers furnished 1,005,798 of the aggregate importation of 1,405,839 kilos, or approximately seventy per cent.

The prospect of American tires retaining their hold upon the market is far better than that of some of the other lines of rubber goods. Prior to the war the foreign cars were much in favor, despite their excessive cost and cumbersome style and weight. The popular priced American car is fast revolutionizing the motor markets now and European manufacturers are generally seeking an answer in a lighter and cheaper car. Today most of the foreign cars in Argentina are of ancient vintage, redecorated and re-upholstered.

American tire concerns likewise scored a big hit by introducing typical American service. European tires had been placed generally with distributors in the larger cities and further exploitation was left to them. The enterprising Americans not only found large city distributors but fine-tooth-combed the interior country placing local agents along all motor routes and making it possible in case of an emergency for a city motorist to replace his blown tire with a minimum of delay. Another feature working against the foreign made tire is the fact that straight side tires are used on the great majority of American machines. Most foreign tires are clincher style.

During the last two years American makers have been supplying about thirty per cent of the waterproof piece goods, but in waterproof cloaks and overcoats has been steadily losing to Great Britain. Of the considerable business in elastic web for shoes, corsets, garters etc. the United States does practically nothing. The local answer is superior quality in the foreign made articles. Europe also has the call in gutta percha goods. In druggists' rubber sundries American exports have more than doubled in the last three years, but Great Britain still has the call in the better grades and Germany undersells us in the medium to cheaper grades, our quality being generally between the two.

America show to better advantage in mechanical and electric rubber goods and especially well in rubber hose and tubing, registering close to seventy-five per cent. of the latter in 1918. Likewise of late American rubber insulating tape has been making tremendous inroads upon the foreign supply, Tennis, golf and soft rubber balls, the latter used chiefly by the "gaucho," o r native element in the universally popular game of Basque ball, are supplied chiefly by Great Britain. Ladies' bathing caps are generally American, as are to a considerable degree the rubber heels, tips and soles for shoes.

Conditions Uniform in South America

While statistics furnished herewith apply wholly to the Argentine much the same generrl condition applies to the other South American countries, the supplies however varying according to climatic demands. America's chief competition since the war had been from Great Britain and Germany. In many cases the local preference is for British goods, they having had a long established run and won permanent favor. Moreover it must be admitted that the British manufacturer has stressed quality through all the years when some American manufacturers have not been over particular. The German relies generally upon his ability to provide a cheaper imitation.

Just now, with competition becoming keener daily, the question of more liberal credits is dominant throughout Latin-America. The foreign manufacturers have been accustomed to granting liberal credit extensions. The average American has hesitated at more than 60 to 90 days. Americans must change their position if they hope to hold their own.

National Foreign Trade Council

Rubber Division Holds Spring Meeting

Semi-Annual Gathering of Rubber Chemists Held in Connection with Meeting of the American Chemical Society at Rochester, N. Y., April 27 and 28—Many Interesting Papers Read

Members of the Rubber Division of the American Chemical Society attended the fourth meeting of the division which, held in connection with the sixty-first meeting of the society, took place in Rochester, N. Y., on April 27 and 28. Headquarters of the society were in the Rochester Hotel while the meetings of the division, which were attended by over seventy members, took place at the Mechanic's Institute. The meeting was featured by a number of interesting papers which were well received by those in attendance.

Nearly all of the first day's session was devoted to a discussion of methods for the analysis of rubber goods. The Rubber Division desires to have ready in the near future, tentative methods of analytic procedure and accordingly various methods of dealing with different determinations were discussed. The formulation of the first outline was left in the hands of the following committee: S. Collier, chairman; F. J. Dugan, A. H. Smith, W. J. Weigand and H. E. Simmons.

It was also stated that the division desired the abstract information on any technical manufacturing and plant article which it is not possible to print in "Chemical Abstracts". The committee consisting of W. W. Evans, chairman; R. C. Hall and C. W. Bedford was instructed to secure the cooperation of the various trade journals so that abstract information not published in "Chemical Abstracts", because of limited space, would be reproduced in these trade journals.

The Accelerator Committee was instructed to tabulate all available information concerning the constituencies of the accelerators now on the market and to forward copies to all members of the division.

A new Physical Testing Committee was appointed as follows: C. O. North, chairman; W. J. Weigand, S. Collier, E. H. Grafton and H. E. Simmons. This committee was instructed primarily to consider the standardization of methods of plotting stress strain curves and other such data obtained in rubber compounds; standardization of experimental mixes and testing of various rubbers and other materials. An investigation of any new methods of physical testing by which the rubber chemists could better judge definite degrees of vulcanization for the probable life of their rubber compounds was also advocated.

The reading of the various papers upon the program was followed by a round table discussion at which the following subjects were given close attention: "Factory Control of Vulcanization"; "The Testing of Crude Rubber as Received at the Factory", and "The Reaction between Sulphur and Various Softeners".

The following are short abstracts of the various papers read at the meeting:

"The Analysis of Rubber Goods Containing Antimony Pigments." by: S. Collier and Michael Levin, Bureau of Standards.

The amount of rubber and antimony are determined on the same sample. A sample previously extracted with acetone is dissolved by heating in cymene. The solution is diluted with petroleum ether and filtered through a Gooch crucible after the fillers have settled out. The antimony sulfide is dissolved out with hydrochloric acid, precipitated with hydrogen sulfide, and determined volumetrically by titration with standardized potassium permanganate. A correction for insoluble organic matter is made by drying, weighing and igniting the crucible. The sulfur fillers are determined on a separate sample which has been filtered from the cymene-petroleum ether solution and washed with solvent.

"Reactions of Accelerators During Vulcanization. Carbosulfydryl Accelerators and the Action of Zinc Oxide. by C. W. Bedford and L. B. Sebrell was an extremely interesting paper.

The reactions of accelerators producing mercapto grumps by action of sulfur were discussed. Thio carbanilide with aniline in benzol solution will dissolve zinc oxide and will vulcanize a zinc oxide cement at room temperature. Other zinc salts of mercaptains such as zinc thiophenol and zinc-ethyl xanthate will vulcanize pure gum cements containing sulfur at room temperature. These accelerators are free from nitrogen or alkali and also function in press and steam cures. Without zinc oxide no accelerator has been found which will vulcanize at room temperature. Zinc salts of carbo-sulfydryl accelerators furnishes the key to the paper.

Direct Determination of Sulfur of Vulcanization

"The Direct Determination of the Sulfur of Vulcanization". by S. Collier and Michael Levin, of the Bureau of Standards. The sulfur actually combined with the rubber which fact was determined by dissolving the rubber and polyprene sulfide in cymene. The solution is diluted with petroleum ether and filtered after the fillers have settled out. The filtrate containing the polyprene sulfide is evaporated to dryness by heating on the steam bath and by means of a gentle current of air. The residue is dissolved in nitric acid and the solution evaporated to dryness. 3 cc of nitric acid are added to the residue and then 5 gram of sodium carbonate. The mixture is fused and the amount of sulfur determined.

"The Relative Thermal Conductivity of Some Rubber Compounds". by Dr. A. A. Somerville, R. T. Vanderbilt Co., showed that rubber mixes have been made containing different amounts of sulfur, with and without accelerators, with equivalent volumes of various fillers, and given a range of cures. The thermal conductivities of these samples have been compared and the results of the test indicate a wide variation in thermal conductivities due to different fillers being used.

"The Influence of Piperidine-Piperdyl-Dithiocarbamate on Vulcanization". by G. Stafford Whitby and O. J. Walker. The authors stated that tested in a 90:10 rubber-sulfur mix, 1 per cent of the base mentioned is found to reduce the time of cure by seven-eighths and even at 130 deg. to lead to curing in about one-third of the time required at 141 deg. in its absence. At the optimum cure rubber containing the base showed (a) a noticeably lower sulfur coefficient, (b) a very considerably higher breaking stress, (c) a noticeably smaller elongation, and (d) a lower position of the stress-strain curve (strains as ordinates) than did rubber from which the base was absent. On aging for seven months, vulcanizates prepared with the base behaved in a manner essentially similar to that shown by vulcanizates prepared without it: the stress-strain curves coming down the paper to a similar extent and the breaking points altering in a similar way.

"Contribution to the Knowledge of the Resins of Hevea Rubber". by G. Stafford Whitby and J. Dolid. A number of crystalline substances, as follows, have been isolated from the acetone extract of plantation Hevea rubber. At least two of these are sterols. The less soluble of the two constitutes roughly 5 per cent of the extract; it decomposes without melting, and forms an optically active acetate crystallizing in leaflets and melting at 169 deg. With this sterol another substance, not yet isolated in a state of purity, was associated. The more soluble of the two sterols consisted of matted, flexible leaflets, melting at 127 deg. and showing $(\ )_D^{-25^\circ}$. In addition a substance, optically inactive, melting at 62 deg., and also constituting roughly 5 per cent of the extract, was obtained. Quebrachitol was isolated from the extract, and was found to occur generally in sheet and crepe. Further; the results of a quantitative study of the oxidation of caoutchouc under the catalytic influence of copper are reported.

(Continued on page 95)

Proposed Tentative Specifications for Insulating and Adhesive Tape

The following tentative specifications for rubber insulating tape and adhesive tape for electrical purposes were discussed at the meeting of Committee D-11 on Rubber Products of the American Society for Testing Materials held in New York City on March 28.

Rubber Insulating Tape

1. These specifications cover rubber insulating tape to be used for insulating joints in electric wires and cables.

I. Manufacture

2. The tape shall be rubber compound which shall be well, evenly and smoothly calendered, cut to uniform width and tightly wound in rolls with a glazed cloth or a linen separator interposed between adjacent layers.

3. The separator shall be attached to and cover the outer side of the tape. When unwound from the original roll, it shall show no undue tendency to stick to the rubber.

II. Chemical Properties and Tests

4. The tape shall be a rubber compound containing not less than 30 per cent of the best quality Hevea rubber, not more than one per cent of free sulphur and not more than 4 per cent of waxy hydrocarbons.

The remainder shall consist only of suitable dry inorganic mineral fillers. The compound shall contain no reclaimed rubber, substitutes or organic matter other than new rubber of the prescribed quality. All percentages shall be based on the weight of the original compound.

5. If an analysis of the compound is made, it shall be carried out in accordance with the Joint Rubber Insulation Committee's Procedure (See A.S.T.M. Specification D 27 - 21 T, "Insulated Wire and Cable, 30 Per Cent Hevea Rubber").

III. Physical Properties and Tests

6. (a) The tensile strength of the tape shall not be less than 300 lbs. per square inch.

(b) The tests shall be made with a power driven, pendulum type tension testing machine; the initial distance between the jaws shall be three inches and the rate of separation of the jaws shall be 20 inches per minute. The width of the test specimen shall be 0.5 inch.

(c) Three specimens of each sample free from visible flaws shall be tested. The average result shall be taken as the tensile strength.

(d) The temperature of the room shall not be lower than 65 deg. F. (18 deg. C.) nor higher than 90 deg. F. (32 deg. C.) and the samples shall have been kept within these temperatures limits for at least ½ hour-previous to the time of testing.

7. Two brass-ball sphere electrodes 2 cm. in diameter shall be brought so close together that the sample of tape can be just moved between them. The tape shall withstand without puncturing the application of a potential of 10,000 volts (r.m.s. value) for a period of five minutes applied to the sphere electrodes at a frequency not exceeding 65 cycles per second.

8. The tape when wraped to a thickness of ¼ inch and heated to a temperature of 150 deg. F. (65.5 deg. C.) for 20 minutes shall fuse into a homogeneous mass.

9. One roll for each 250 rolls shall be selected at random for test. At least 2 feet of the outer layers shall be removed and discarded before taking specimen for test.

IV. Standard Weights, Dimensions and Variations

10. The tape shall conform to the following requirements:

Width inches	Thickness inches	Nominal Weight Per Roll, Lb.	Minimum Net Weight per 100 Rolls, Lb.(1)	Minimum Length Per Pound, Yds.(2)
½	0.035	½	50	22½
¾	0.035	½	50	15
1	0.035	1	100	11¼

(1) Exclusive of core, wrapping and box.
(2) " " " " " box and separator.

11. The width shall not vary from the specified value by more than 1/32 inch. The thickness shall not vary from the specified value by more than 0.003 inch.

12. The thickness shall be measured with a micrometer graduated to 0.001 inch having a circular foot 0.024 to 0.26 inch in diameter and with a pressure on the specimen not less than 8 ounces or more than 10 ounces. Four measurements shall be made at random in a length of not less than 3 feet and no measurement shall be outside the limits prescribed in Sections 10 and 11.

V. Packing and Marking

13. Each roll shall be wraped in oiled paper or metal foil and enclosed in a suitable box. The wrapping shall be secure and shall thoroughly protect the contents.

14. Each box shall be marked with the name of the manufacturer or trade mark and the nominal width and weight of the tape.

VI. Inspection and Rejection

15. The tape shall be tested and inspected within four weeks of the date of delivery.

16. If the tape fails in any one test of those prescribed in these specifications, two additional specimens shall be taken and submitted to that test. If either of these two additional specimens fails, the lot of tape represented by that sample roll shall be rejected.

Adhesive Tape for Electrical Purposes

1. These specifications cover adhesive tape also called "friction" tape consisting of strips of cotton sheeting impregnated with an adhesive insulating compound. The tape is largely used to cover electrical insulation applied to wires and cables.

I. Manufacture

2. The cotton sheeting layer shall be made from a sheeting evenly and firmly woven from good cotton and as free from unsightly defects, dirt, knots, lumps and irregularities of twist as is consistent with the best manufacturing practice. The threads shall run in as straight lines as possible without waving so as to reduce to a minimum the raveling of the cloth when cut into tape.

3. The frictioning compound shall be an adhesive and insulating compound practically free from free sulphur or other substances which would have a deteriorating effect on copper or other metals or on the fabric.

4. The fabric shall be thoroughly impregnated and evenly covered on both sides with the frictioning compound.

5. The compound shall adhere firmly to the fabric and shall not pull away from the fabric so as to leave bare spots when adjacent layers of the tape are separated.

II. Chemical Properties

6. The compound shall not contain more than 0.05 per cent of free sulphur.

7. When wrapped on a clean, smooth copper rod and baked at 100 deg. C. for 16 hours, the compound shall not discolor the copper.

III. Physical Properties and Tests

8. When the tape is held before a strong light, the number of pin holes shall be determined in a length of not less than three yards. The number of pin holes shall not exceed the limits given in the following tabulation:

Width, inches	Max. total number in 3 yds.	Max. number in any single yd.
½	6	3
¾	6	3
1	9	4
1-½	12	5
2	15	6

9. The tensile strength of the tape shall not be less than 40 lbs. per inch of width. The initial distance between the jaws of the testing machine shall be 12 inches and the rate of separation of the jaws shall be 20 inches per minute.

10. (a) The adhesion between adjacent layers of the tape shall be such that when a strip of tape two feet long is taken from a roll and wound upon a mandrel one inch in diameter under a tension of 10 lbs. per inch of width at a rate of 30 inches per minute, a weight of 4 lbs. per inch of width shall not cause the plies to separate at a rate greater than 30 inches per minute.

(b) After a strip has been exposed to dry air at a temperature of 100 deg. C. for 16 hours and there cooled to room temperature, a test specimen shall withstand the test prescribed in section 10 (a) except that the weight applied to unwind the tape shall be 1 1/3 lbs. per inch of width instead of 4 lbs.

11. The test for dielectric strength shall be made as follows: The tape shall be spirally wound with one-third lap on a smooth metal rod, one inch in diameter for a distance of six inches. Two inches in the center shall be covered with metal foil and securely bound with tape. Alternating potential of 1000 volts (r.m.s. value) and having a frequency not exceeding 65 cycles per second shall be applied for five minutes to the metal rod and the metal foil without puncturing the tape.

12. One roll for each 250 rolls shall be selected at random for test. At least two feet of the outer layers shall be removed and discarded before taking specimens for test.

IV. Standard Weight, Dimensions and Variations

13. The tape shall conform to the following requirements:

Width, inches	Thickness, inches	Nominal Weight Per Roll, Lb.	Minimum Net Weight per 100 Rolls, lb.(1)	Minimum Length per pound Yds.(1)
½	0.015	¼	25	82
¾	0.015	½	50	55
1	0.015	½	50	41
1½	0.015	1 or 1½	100 or 125	27
2	0.015	1½	150	20

(1) Exclusive of core, wrapping and box.

14. The thickness shall be measured with a micrometer graduated to 0.001 inch, having a circular foot 0.24 to 0.26 inch diameter and with a pressure on the specimen not less than 8 ounces nor more than 10 ounces. Five measurements shall be made at random in a length of not less than 3 feet and no result shall be outside the limits prescribed.

15. The width shall not vary from the specified value by more than 1/32 inch. The thickness shall not vary from the specified value by more than 0.002 inch.

V. Packing and Marking

16. Each roll shall be wrapped in oil paper or metal foil and enclosed in a suitable box. The wrapping shall be secure and shall thoroughly protect the contents.

17. Each box shall be marked with the name of the manufacturer or a trade mark together with the nominal width and weight of the tape.

VI. Inspection and Rejection

18. The tape shall be inspected and tested within four weeks from the date of delivery.

19. If the tape fails in any one test of those prescribed in these specifications, two additional specimens will be taken and submitted to that test. If either of these two additional specimens fails, the lot of tape represented by that sample shall be rejected.

Rubber Division Holds Meeting

(Continued from page 93)

"The Solubility of Gases in Rubber as Effecting their Permeability" by Charles S. Venable and Tyler Fuwa.

An experimental study was made of the various factors influencing the solubility of a gas in rubber. It was found that when rubber absorbs the gas, this gas is held in true solution and not by adsorption. In the case of carbon dioxide, which has about an average solubility, the amount of gas thus held in true solution by the rubber is directly proportional to the pressure and decreases with increasing temperature. This solubility is uneffected by degree of vulcanization or by the presence of compounding ingredients. Evidence was presented to show that the other gases behave in a similar manner.

Relative solubility values obtained for various gases in rubber show that there is a general relationship between the solubility and density of the gas and its rate of penetration through rubber. These results, in general, confirm the original hypothesis of Graham that the penetration mechanism consists in the solution of the gas at one surface of the rubber and the diffusion of the undissolved gas through the rubber and its evaporation at the other surface. The indications are, however, that the actual size of the gas molecule is also an appreciable factor.

A striking relationship between the solubility of various gases in rubber and in water has been noted.

"The Volume Increase of Compounded Rubber Under Strain", by Henry Green was an excellent paper during the course of which lantern slides of considerable microscopic work done on the subject were shown. The speaker discussed the original work of H. F. Schippel showing that the conclusions drawn by Mr. Schippel were correct and at the same time bringing forth evidence to the effect that others were not so well substantiated. One particular microscopic photo of considerable interest was that of a barytes stock under stress showing the small vacuua of form on both sides of the barytes particles.

Another paper was *"The Rapid Bomb Method for the Determination of Sulfur in the Rubber Compound"*. This was by W. W. Evans and Ruth E. Merling and showed the results of a large number of determinations using this method as against the method used by the Bureau of Standards. The chief feature of the bomb method is that the result may be obtained within three hours after the analysis is started. The results are slightly higher than those found by the Bureau of Standards.

Airplane Tires and Wheels

McCook Field, Air Service Engineering Division at Dayton, Ohio, activities in the rubber materials used in aircraft construction have been mainly centered around the development of the straight side tires and wheels. A satisfactory program of wheel and tire sizes has been drawn up after considerable experimental work, and it is hoped that tire and wheel replacements will be of the straightside type, rather than of the present clincher type.

Experimental work on the development of straight side tires and wheels has extended over a period of about two years. The chief reason for an attempt to develop the straight side tire has been that the unsatisfactory performance of the clincher type was most marked in the case of the DeHaviland airplanes, which use the 750 x 125 millimeter tires.

The first service test on the straight side tires was made with the 44 x 10 inch tire, used on the Glenn L. Martin airplane, of the type which has only two wheels. To date, the performance of these tires, and the service, which extended over a period of about six months, has been very satisfactory.

Another size which has been subjected to service conditions is the 36 x 8 inch tire, which was developed with a view to replacing the 900 x 200 millimeter size. An essential difference between this size and the 44 x 10 inch size is that the wheel for the 36 x 8 inch tire has a one piece rim, having a channel in the center to permit of the application of the casing. In general, it resembles a type of rim used on the Fokker D-7, which was equipped with a straight side tire. The wheel for the 44 x 10 inch tire has a truck type rim. This includes the removable side ring, to permit of ease of application or removal of the casing.

In every case of straight side tires, the wheel used has a hub which is centered in the wheel, as opposed to the Palmer type of off-set hub. Other sized tires are being manufactured for service test and it should not be long before complete information is available regarding the suitability and serviceability of this type, as compared to the original clincher type. It is believed that the difficulties, experienced with the clincher type tires, especially when used on the Palmer type wheel, will be completely overcome in the new straight side tires.

NEWS OF THE INDUSTRY

News -- Personals -- Financial -- Building Activities -- New Products

Tire Industry Continues to Improve

(Special Akron Correspondence)

May first reports from the many rubber factories in the Akron manufacturing district showed a distinct improvement over those of April 1.

The Firestone Tire & Rubber Co. reported that production had been increased during April to 15,000 tires a day and that the goal during May was 20,000 daily. Men are being hired daily at this plant.

Tire production tickets at the Goodyear Tire & Rubber Co. also have been raised during the month just past and it is reported that this plant will be turning out over 20,000 casings, and the same number of tubes daily within a short period.

Increases are also reported by other companies, but no official figures on tire production in the other plants have been given out.

Akron companies have resumed advertising campaigns and sales managers show much more optimism now than has been exhibited for many months. Resumption of work in automobile factories calling for tires for original equipment is helping the Akron companies on their way back to normalcy.

The four big tire companies in Akron —Firestone, Goodrich, Goodyear and Miller—despite the tire industry slump, had, in 1920, total sales aggregating $502,872,639, as compared to $429,095,-101 during 1919, an increase of $73,419,-136. Present statistics show that all Akron factories are working on an average of not less than 50 per cent of normal. This means that they are doing business now at the rate of almost $275,000,000 a year, a substantial business for any city to be doing under present conditions.

In many respects many good results have come from the tire industry slump in Akron. One clear evidence is that it has taught employers not to be reckless or extravagant, as in the past. It has eliminated the transient and undesirable element of labor, and has produced greater efficiency in factory work.

The slump has given Akron time to catch up with herself in civic improvement. No city can increase in population from 69,000 to 208,000 in ten years and have civic development keep pace with industrial growth and population increase. Conditions are now different. The city is regaining its balance. Nearly $75,000,000 worth of public improvements are contemplated. Boulevards and hundreds of miles of paved streets are to be built. The city has created a planning commission which is arranging an extensive program of civic improvement and city beautification. It has purchased 700 acres of land for a public park. It is increasing its hospital facilities, widening its main thoroughfares, planning a new postoffice, is erecting new hotels and is also planning three new theaters. In addition there are many home-building programs under way.

In short, Akron has had time to catch her breath again and will be a better and cleaner city in which to live.

Col. Colt Predicts Good Business

Colonel Samuel P. Colt, chairman of the United States Rubber Company, told stockholders at the annual meeting held in New Brunswick, N. J., April 19 that the number of tires sold in 1921 will be greater than in 1920 or in 1919 or in any previous year in the history of the world.

After reading his report for 1920, Colonel Colt said:

"The stockholders, directors and officers of this company have every reason to be proud of the record made during 1920, particularly in view of the unfavorable conditions prevailing in the latter part of that period.

"In spite of the stringency of the money market and of slow collections generally in business our company met every merchandise bill at maturity and took advantage of every discount privilege offered in the payment of such bills. We ask no favors of anybody.

"Furthermore the company earned and paid the full eight per cent dividend on both the preferred and common stocks and was able to show a surplus of about $10,000,000 over those requirements and every other obligation."

At the annual meeting of stockholders the retiring directors were re-elected.

John W. Davis, recent Ambassador of the United States to Great Britain, was elected a member of the board. He is to become general counsel of the company.

Tires for Mexico

The postoffice department announces that postmasters may accept automobile tires up to a weight limit of 35 pounds each for places in Mexico reached by railroad from the United States. Such tires may be sent outside of mail bags when their bulk prevents enclosure in sacks, and tires will be accepted in Mexico under the same conditions for destination to the United States.

India Pays Dividend

The India Tire & Rubber Company, Akron, Ohio, paid on April 1 a quarterly dividend of 1¾ per cent on its preferred stock and 2 per cent on its common stock.

Reduction in Tire Prices

(Special Akron Correspondence)

The long-expected break in tire prices came May 2 when the B. F. Goodrich Co. put into effect a 20 per cent reduction on Silvertown cord tires, fabric tires and inner tubes. Many other companies followed while others have announced their intention of doing so in the immediate future.

A reduction in tire prices has been one of the leading topics of discussion in Akron rubber circles for the past six months or so. There have been many rumors of impending action along this line, but none culminated until the Goodrich announcement was printed throughout the country on April 30.

The price reduction brought forth two different expressions as to its advisability. On one hand it was argued that the cut would put the tire industry back on its feet much more rapidly than otherwise would have been possible by breaking the "buying strike". On the other it was pointed out that Akron companies still had large stocks of high priced materials and that to cut prices with these stocks on hand would result in a material reduction in profits for the present year. This was answered with the argument that all companies wrote off huge sums in inventory losses last year in order to carry stocks at present market prices.

The reduction was the second since the slump hit the tire industry. The first was 15 per cent. The second of 20 per cent brings the price of tires down 32 per cent from the peak and below the 10-year average.

This reduction of 32 per cent is not as much as has been the drop in raw material prices which averages close to 50 per cent. It is, however, more than the cut in wages which, latest figures available show, hovers around the 25 per cent mark.

In the official announcement, the Goodrich company said: "The price adjustment was made to meet new conditions. Automobile owners are given the full benefit of these new prices right at a time when they are ready to replace old tires with new ones."

As RUBBER AGE goes to press announcement is made by the United States Tire Co. of reductions ranging from 11½ per cent on Royal cords to 20 per cent on inner tubes.

The Firestone Tire & Rubber Co. has announced a reduction of from 11¼ per cent on cords to 20 per cent on tubes.

Kelly-Springfield Tire Co. has likewise made public the fact that reductions of from 15 to 20 per cent have been made. Pennsylvania Rubber Co. and Mason Tire & Rubber Co. have announced reductions and others are in order.

News from the Trenton Manufacturers

Conditions Improving in Trenton—Acme Rubber Postpones Building—Receiver Earns Profit—Receivers Certificates Issued—Trenton Zinc Expands—Stokes Asbestos in Production

Conditions Improving in Trenton

(Special Trenton Correspondence)

Trenton tire manufacturers report business steadily increasing, while the mechanical end of the trade shows no gains. The Thermoid Rubber Company is now running about 35 per cent of capacity with 75 per cen t of possible output. About 350 men are now at work at the plant and the company is anxious to find employment for the remainder of the mechanical force. The Bergougnan Rubber Corporation is running 75 per cent capacity. Warren A. Clapp, treasurer of the company, says that the company has experienced a steady improvement during the past few weeks.

It was rumored in Trenton recently that the Empire Tire & Rubber Corporation had received an order for 40,000tires. C. Edward Murray, Jr., vice-president of the company, said that no such sized order had been received, but that the concern's business was picking up and everthing looked very encouraging. He said he believed that business would increase with each coming month.

The Ajax Rubber Company is not discouraged over the present conditions and is looking ahead and making plans for the anticipated revival in business. It was stated at the office of the company that operations there had been curtailed to permit the installation of new machinery and improved equipment. The present plans contemplate a renewal of activities on a larger scale within a few weeks.

The Essex Rubber Company is operating on a full basis, while the Whitehead Brothers' Rubber Company is operating but three days a week. The employes earn just about enough to keep the wolf from the door and are hoping that business will revive. Some of the departments of the Vulcanized Rubber Company are working on part time only, with others on full time. The Zee Zee Rubber Company has placed more men at work in making tires.

Acme Rubber Postpones Building

(Special Trenton Correspondence)

The proposed addition to the plant of the Acme Rubber Manufacturing Company, Trenton, N. J., will not be built until business conditions become better. The company had plans drawn for a one story addition, 90 by 300 feet to cost $60,000, but the slump in the tire industry caused the officials to abandon the idea of enlarging the factory.

Receiver Earns Profit

(Special Trenton Correspondence)

In an intermediate report filed by John O. Bigelow, of Newark, N. J., with the clerk of the United States District Court at Trenton, N. J., it is stated that Mr. Bigelow, as trustee in bankruptcy for the Trent Rubber Company, Trenton, N. J., has earned "an apparent profit of $6,545.32," by a partial operation of the plant. An order has been issued by United States Judge Lynch directing those interested to show cause on May 16 why the receivership should not be confirmed.

Receivers Certificates Issued

(Special Trenton Correspondence)

Arthur H. Wood and C. Edward Murray, Jr., receivers for the Empire Tire & Rubber Corporation, Trenton, N. J., have received an order from United States Judge Joseph L. Bodine allowing them to issue $300,000 in receivers' certificates in order to keep the plant running and pay wages and other expenses.. The receivers were first allowed to borrow $50,000 and the court later decided that $250,000 more was needed to keep the factory in operation and pay debts. Business is improving at the plant.

Trenton Zinc Expands

(Special Trenton Correspondence)

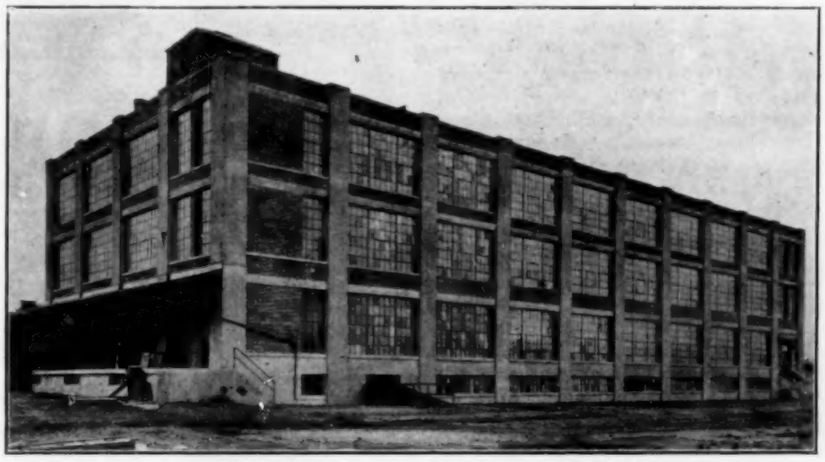
Owing to increased business the Trenton Zinc & Chemical Company, Trenton, N. J., will shortly erect additions to the plant along the Delaware river. The company manufactures zinc oxide, which is used largely in the rubber industry. Last year the company produced 2,000,000 pounds of zinc oxide and will turn out 12,000,000 pounds when the additional units are completed and the machinery increased. The Company is capitalized at $50,000,000 and was recently taken over by a new concern composed of prominent Trenton men. The company, which was formerly the M. M. S. Metal Company, has contracts for the output of the mines in Salem, Ky. The company now has more than 800,000 pounds of zinc in the yards of the factory to be converted into zinc oxide. The concern will engage a New York engineering firm to plan the new additions.

Stokes Asbestos in Production

(Special Trenton Correspondence)

The new plant of the Stokes Asbestos Company, at Trenton, N. J., is a big asset to the automobile industry and its product means much to the autoist as far as accidents are concerned. As is already known efficient brake action on automobiles is due largely to good brake lining. The Stokes company manufactures from the raw material asbestos metallic cloth that goes into the finished product of the Thermoid Rubber Company whose folded and stitched, hydraulic compressed brake lining is used in many of the leading automobiles and also in many industrial appliances.

The new plant of the Stokes Company was built by Karno SmithCompany, of Trenton and is 80 by 800 feet. The construction was commenced in April, 1920, and was finished last fall, but the months following have been accompanied with the installation of machinery, etc., with the result that production was not started until a few weeks ago. The building was designed and constructed for its particular use and is modern in every detail. It has a basement and three stories, arranged in such a manner that another story may be added.



PLANT OF THE STOKES ASBESTOS CO., TRENTON, N. J.

The Stokes Asbestos company is capitalized at $1,000,000 the officers being: president, J. Oliver Stokes; vice-president, William J. B. Stokes; treasurer, Robert J. Stokes, who also acts as assistant-secretary. William C. Aichele is the superintendent, and Edmund W. Craft the purchasing agent. The plant is now running on a basis of less than twenty per cent of its capacity, but it is anticipated that when business conditions reach normaley during the coming summer months the plant will be operating to the maximum limit of its productive capacity. Being so closely connected with the Thermoid Rubber Company, the amount of business depends largely on the amount of the finished material produced by the rubber company. The Thermoid Rubber Company manufactures hydraulic compressed brake lining, clutch discs, brake blocks, etc., made from asbestos metallic cloth, the product of the Stokes Asbestos Company.

New Size U. S. Tire

The United States Tire Company announces that, in keeping with the trend of automobile design toward lower center of gravity, it is preparing to market a 31 x 4, straightside Royal Cord tire. This new size will give the smaller cars the same features of performance derived from the 33 x 5 on larger models, and is of particular interest as being an extension of the superior straightside principle into those sizes of tires which have heretofore been exclusively of the clincher bead type.

Tirometer Tube in Production

A new tube known as the Tirometer heavy touring tube, is being placed on the market by the Currie Brothers Company, Inc., of Atlanta, Ga.

The personnel of the corporation includes J. W. Currie, J. S. Currie, E. H. Currie with P. W. Hutcheson as general manager. J. W. Currie, president, was formerly one of the largest tire distributors in the South, having been the senior member of the firm of Currie-Akers Tire Company. He will act as president of the new corporation. J. S. and E. H. Currie have heretofore operated one of the South's most successful manufacturer agencies.

The firm is establishing branch offices in New York, Chicago, Cleveland, Kansas City, Denver and Los Angeles.

All Firestone Employes Stockholders

The trend of American wage-earners' thought and action toward new habits of thrift and investment is evidenced in the announcement of the Firestone Tire & Rubber Company, Akron, Ohio, made April 27, that every one of its several thousand employes had become stockholders.

Within twelve hours after the announcement by President H. S. Firestone of a new allotment of employes' stock, subscription records showed that every employe had become a stockholder, each subscriber taking at least two shares while oversubscriptions on the allotment amounted to almost fifty per cent.

This places the Firestone Company in a most distinctive position among industrial concerns employing more than 10,000 people as it is the only organization of its rank on record having every man and woman on its payroll a shareholder in the company. It brings the total number of shares subscribed for by employes close to 45,000.

Rosetahl with Tropical Tire

Announcement has been made of the appointment of David C. Rosetahl as sales manager of The Tropical Tire and Rubber Company, 365 Broadway, New York. Mr Rosetahl was formerly the general sales manager of the B. and K. Mfg. Company, Inc., of New Haven, Conn. He brings with him a wealth of sales experience in the auto accessories, tire and kindred lines. The new selling system inaugurated by him for Tropical embraces an agency for Tropical tires in every city of a population of 50,000 and over in the United States.

Though the tire industry as a whole has undergone severe financial tests in the past year, it is stated that the Tropical Tire & Rubber Co., Inc., for this period has shown a substantial increase in sales and profits. The finances of the company at the present time are reported in excellent shape—and Mr. Rosetahl looks forward to 1921 as a banner year.

It is stated that the company has successfully completed the contracts entered into with the United States Mail Service last June, covering intermittent deliveries of tires for the various branches of this

DAVID C. ROSETAHL

service all over the country. The sales organization consists of thirty-two men segregated throughout the country.

Mr. Rosetahl when interviewed on the subject had the following to say concerning present tire conditions:

"Judging from the increase in our sales from all over the country in the past month I am inclined to believe that business conditions have improved about fifty per cent during this time. I further believe that dealers throughout the country are realizing that prices have at last dropped to rock bottom. Under these conditions they are replenishing their stocks for they know in order to do a steady legitimate business they must carry a substantial stock of tires on their shelves.

"These signs are very hopeful and should go far toward bringing the tire business back to its normal stride. Furthermore, now that the new national administration has settled down to normalcy, business conditions, as a whole, throughout the country must resume their natural course, and this means that the tire business will take its rightful place among the leaders of our national industries."

Empire Repairs Recent Damage

The Empire Tire & Rubber Corporation of Trenton, N. J., whose plant was badly damaged by a wind storm, has had the falling walls rebuilt and the inner tube and cotton departments are in running order again.

Lambert Directors Dine

On April 18 the directors and stockholders of the Lambert Tire & Rubber Company, Akron, Ohio, held an informal dinner at the City Club of Akron. After the dinner, President H. M. Lambert and Secretary-Treasurer John Hausam told of the excellent condition of the company at present and explained the sales and manufacturing policies for this year. They said that the demand for Lambert "Trublpruf" tires is steadily increasing in all parts of the country, and that plans are now under way to largely increase the manufacturing facilities to keep pace with this demand.

Portage Branch Moves

Announcement is made of the removal of the New York branch of the Portage Tire & Rubber Co. from 1924 Broadway to room 824, Gotham National Bank building, at Columbus Circle. It is stated that in conjunction with this office they are maintaining a tire warehouse at the Bush Terminal in Brooklyn where they are utilizing about 15,000 square feet of space. This change will give the Portage New York branch a greater amount of space than was possible in their former floor location on Broadway and will give it greater facilities for handling its local trade. J. A. Richardson is the branch manager.

Rubber Mill Reopens

The Alice Mill of the Woonsocket Rubber Company, footwear division, United States Rubber Company, will begin reopening on May 9, when the calender room will resume operations with the same wage schedule as in effect when the plant closed February, 19. The mill will start on five days and a reduced number of employes, probably about 1200 which is 600 short of the regular number.

No plans have been decided upon regarding the Millville mill at Millville, Mass., which has been shut down since before Christmas.

Petition Against Rubber Corporation

An involuntary petition in bankruptcy has been filed in the Federal District Court against the Rubber Corporation of America of 240 West Fifty-fifth street. In the petition the petitioning creditors are the Equitable Trust Company, the National Park Bank, and Blauvelt Bros., Inc., of New Jersey, with total claims of $145,000. In the petition it is alleged that preferential payment of $65,000 was made to Campbell, Heath & Co., bankers at 5 Nassau street, New York. The liabilities of the company are said to be upward of $1,000,000. No assets were given.

Luzerne Enlarges Plant

The new addition to the Luzerne Rubber Company plant at Trenton, N. J., has been completed and is now in use. The structure is 60 by 60 feet, two stories. The company has purchased additional land to enlarge the plant in the future if the demands calls for it.

News of the Rubber Association

Many Subjects of Interest to the Rubber Trade Discussed in Bulletins Recently Issued by the Rubber Association of America

The following news of the Rubber Association of America, Inc., has appeared in recent bulletins of the organization:

Bureau of Standards Working on Tire Specification

The Bureau of Standards has called together a number of tire manufacturers who were represented by their technical and tire-building experts in a conference at Washington on April 8, to discuss a standard tire specification.

A tentative specification had been prepared by the Bureau and this was studied in detail at the conference but many of the tire manufacturers who had been notified responded to the Bureau with the suggestion that the development of a standard tire specification could more effectively be handled by the machinery available in the Rubber Association than by the Bureau in negotiation with individual manufacturers.

The Technical Committee of the Tire Manufacturers' Division met at the offices of the association on April 14 at which time the tentative specification received the careful study of the members of the committee as well as a number of technical representatives of manufacturers who had been invited to attend the meeting. Following a two day conference adjournment was taken with the understanding that the work be resumed in Cleveland on April 26. Since the conference the Bureau of Standards has asked the Rubber Association to recommend a specification for bicycle tires.

Standard Equipment for Repair of Conveyor Belts and Splicing of Small Endless Belts in Field

The executive committee of the Mechanical Rubber Goods Manufacturers' Division at a recent meeting discussed the need for satisfactory standard equipment for the repair of conveyor belts and for the splicing of small endless belts in the field. It was decided to ask the Specification Committee of the Mechanical Rubber Goods Manufacturers' Division to give its attention to the matter, with the purpose of developing standard equipment which could be recommended as a practical proposition. The Specification Committee is now at work on the problem.

Bureau of Standards Specification for Cotton Rubber Lined Fire Hose Approved

The Bureau of Standards specification for cotton rubber lined fire hose has been revised by the Bureau to such an extent as to be acceptable to the Specifications Committee of the Mechanical Rubber Goods Manufacturers' Division. The Bureau advises that although it may be several months before the specification is ready in printed form nevertheless it is available for use by those who desire to ask for it.

Study Standardization of Pulleys for Rubber Belting

As a result of consideration of the matter by the Executive Committee of the Mechanical Rubber Goods Manufacturers' Division at a recent meeting, a sub-committee of the division, constituted of engineers, will study the subject of standardizing pulleys for use in connection with rubber belting.

The sub-committee recently held a meeting and issued a preliminary report which is as follows:

"The subject seems to naturally divide itself into three parts, viz:

1. The basic theory of the transmission of power from the rubber belt standpoint.
2. The standardization of pulley sizes and a limitation of those sizes.
3. The standardization of belt sizes from a stocking standpoint.

The Engineerying Sub-Committee is proceeding on this basis, and hopes to be in a position to submit some concrete recommendations in the near future."

Cost Accounting for Rubber Goods Manufacturers

The board of directors approved a plan for an inquiry by the association into the possibilities of a study of the cost accounting problems of rubber goods manufacturers with the object eventually of outlining cost accounting methods for various branches of the industry which would be so sound as to the fundamentals and principles involved as to permit their adoption by members, sufficient flexibility in the outline being maintained to make it possible for it to be adapted to any individual conditions.

The first move in this direction is the appointment of a Cost Accounting Committee which will be constituted of experienced accounting executives from the staffs of the following named companies:

The B. F. Goodrich Company.
The Firestone Tire & Rubber Co.
United States Rubber Company.
Hood Rubber Company.
Ajax Rubber Company, Inc.
The Fisk Rubber Company.
Boston Woven Hose & Rubber Co.
Miller Rubber Company.
Star Rubber Company.
Kelly-Springfield Tire Company.
(And one to be designated by the Rubber Manufactures' Association of N. J.—Trenton Association.)

It is probable that the Cost Accounting Committee will be called together in the near future to discuss plans for its future work.

Maximum Load Carrying Capacities of Pneumatic Truck Tires

The association through its publicity department is planning to devote considerable attention to the task of acquainting truck manufacturers with the fact that the weights specified are the maximum load carrying capacities of pneumatic truck tires. The advisability of acquainting truck manufacturers with the fact that these weights are *maximum* was emphasized by the passing of resolution to that effect at the meeting of the Executive Committee of the Tire and Rim Association which was held in Cleveland, March 23.

Service Charge on Returned Tires and Accessories

The Executive Committee of the Tire Manufacturers' Division has recently turned its attention to the difficulties resulting from the tendency on the part of purchasers to return tires and accessories to the manufacturer. As a result of the discussion a recommendation was made to all members of the division that a service charge, based on a percentage of the invoice cost of the returned goods plus the return freight charges, be applied by the manufacturer upon the customer returning the goods. The recommendation received practically a unanimous approval from the members of the division.

Carload Rating on Crude Rubber and Rubber Compounds

The present rating on crude rubber and rubber compounds in carloads is fourth class in all territories. The Traffic Committee has filed a request with the carriers' freight classification committee having jurisdiction over the entire United States, asking that a hearing be granted on the Traffic Committee's application for reduction in this rating to fifth class.

Joint Through Rates from Gulf Ports to Ohio Ports

Heretofore there have been no joint through class or commodity freight rates from New Orleans, Mobile, Pensacola and other Gulf ports in that vicinity to Akron and other rubber manufacturing localities in northeastern Ohio. As a result of negotiation by the Traffic Committee with the Southern lines those carriers have agreed to establish joint through rates to that territory at an early date.

Traffic Managers Inspect Terminal Facilities at Baltimore

In view of the prevailing high rates on tires from Eastern manufacturing points to Pacific Coast points, traffic representatives of tire manufacturers of the East are considering the advisability of shipping via the Panama Canal. Accordingly representatives of ten tire manufacturers visited the Port of Baltimore on April 20 and 21 for the purpose of inspecting the steamship and railroad terminal facilities. The visitors were impressed with both pier and steamship facilities.

The approximate time consumed between Atlantic and Pacific ports is twenty days and in view of the low rates the route is recommended to the membership of the association not only for tires but all other rubber products where rapidity of delivery is not a factor. Announcement is made that the Traffic Department of the Rubber Association of America will be glad to supply detailed information upon request.

Classification of Pneumatic Tires in Georgia

Traffic Bulletin No. 15, dated August 21, 1920, informed members that as Georgia State Classification No. 3 (applying on traffic having origin, destination and entire transportation in the State of Georgia) did not specifically provide a rating for pneumatic tires, first class rates should apply under a ruling of the Georgia State Railroad Commission.

The Georgia State classification has now been revised to provide for the same rating on pneumatic tires in less than carloads, as applicable in the Southern classification, i. e., one and one-half times first class rates when in wrapped bales or wrapped bundles or in wire-bound bundles; and first class when in bundles enclosed in burlap wrapped fibreboard or pulpboard containers or in crates.

April Meeting of Traffic Committee

The April meeting of the Traffic Committee was held in the rooms of the association on April 18 at which time a considerable number of subjects were discussed. Chief among these were the consideration of an amendment to the so-called Pomerere Bill of Lading Act that had been prepared by the Committee on Commerce, Trade and Commercial Law of the American Bar Association, which, if adopted, would place additional safeguards around the use of "order" bills of lading and in other respects would protect the interests of shippers using "straight" bills of lading.

Hearing on L.C.L. Tire Rating

Representatives of the Traffic Committee appeared before the Consolidated Classification Committee on April 19 at New York City in connection with the committee's application for reduction in the classification rating of pneumatic tires, in paper wrapped bundles in less than carloads, from one and one-half times first class to first class. A comprehensive presentation was made from the standpoint of the tire industry, and favorable action by the railroads is anticipated.

Changes in Consolidated Freight Classification No. 2

Supplement No. 2 to Consolidated Freight Classification No. 2 has been published, effective May 25, 1921, changing ratings on the following rubber products:

Artificial Leather or Auto Top Material: Second class rates on shipments in any quantity has heretofore applied to southern points but effective May 25, the rating will be fourth class in carloads.

Crude Rubber: Shipments of crude rubber to points in the South have been rated third class in any quantity. This rating has been changed to second class less carload and fourth class in carloads.

Fruit Jar Rings: The rating on fruit jar rings to points in the South has been changed from second class in any quantity to second class less than carloads and fourth class carloads.

Pneumatic Tire Valves: This article has been rated as first class in any quantity in all territories. Carload rating of third class with a minimum carload weight of 40,000 lbs. has been established to points in Official and Western classification territories. The rating under the Southern classification is unchanged.

Pneumatic Tires Less Than Carloads in Wire Bound Bundles: First class rating has been established on pneumatic tires, less than carloads, in wire-bound bundles to and between points in the South, instead of one and one-half times first class rates.

Interstate Commerce Commission Dismisses Complaint of Intermediate Rate Association

During the early part of 1920, the Intermediate Rate Association, comprising commercial interests in Spokane, Reno, Prescott, and other Inter-Mountain localities, petitioned the Interstate Commission for the revision of rates to those destinations on a basis lower than applicable to Pacific Coast Territory. To meet this complaint, the rail carriers proposed a complete revision of the Trans-Continental rate structure that would have resulted in the cancellation of all commodity rates on rubber manufactured products to Inter-Mountain and Pacific Coast Territory.

In order to protect the interests of the rubber industry, the Traffic Committee intervened in this case taking a very active part in the conduct of it. The Interstate Commerce Commission has rendered a decision in this case, dismissing the complaint which will result in retaining the commodity rates on rubber manufactured products from all Eastern points to all destinations in Inter-Mountain and Pacific Coast Territory, thus effecting savings in freight charges for the industry amounting to thousands of dollars per annum.

Rubber Association Year Book

The twenty-first year book of the Rubber Association of America, Inc. was recently issued to the membership of the organization. The book is divided into two sections. Section 1 contains the personnel of the association; constituency of the permanent committees and divisions, and the membership roll of the association, all as of April 1, 1921, Section 2 contains the charter; constitution and by-laws; officers and directors of the organization since its founding in 1900; necrology and "in memoriam". The book is well bound in a buff paper cover and is exceedingly well arranged.

Sterling Branch in Chicago

The Sterling Tire Corporation, Rutherford, N. J., has announced that since severing its connection with the Rubber Corporation of America it has opened a Western branch at 1509 South Michigan ave., Chicago. The new branch is located in the center of the tire district and although on the second floor is well equipped to give service. It has a capacity of 6,000 tires and has a power elevator which will carry autos and trucks.

It is the intention of the firm to carry on business with as few branches as possible.

Rubber Products Committee Reports

CommitteeD-11 on Rubber Products, of the American Society for Testing Materials has submitted a report of its activities for the year through its chairman F. M. Farmer. The report states that the committee has held three meetings during the course of the year and has seven standard and two tentative specifications before the society for consideration. These include specifications for fire hose, air hose, steam hose, rubber belting, insulated wire and cables, tape and rubber gloves. The report also says that the committee is planning a specification for cold water pumps, hot water pumps and air pumps as well as specifications for weather-stripping for railroad cars.

Mention is also made that the Bureau of Standards is planning to make an extensive investigation of some of the fundamental problems in connection with vulcanized rubber products and that a committee of Committee D-11 has been asked to advise the Bureau on the program of its work. The committee has recommended that the matter of an accelerated aging test be given first consideration and is hoping that favorable action will be taken on this recommendation.

A.S.T.M. Issues Bulletin

The initial issue of the Bulletin of the American Society for Testing Materials has appeared together with the announcement that the society would issue the bulletin at quarterly intervals in place of the circular letters which have been issued from time to time in the past.

Hunter to Exhibit in London

In order to introduce their special method of drying and processing rubber to foreign trade, the Hunter Dry Kiln Company will have a unit of their system in operation at the Fifth National Rubber Exhibition to be held at Royal Agricultural Hall, London, England, commencing June 3. The exhibit will be under the supervision of Francis Shaw & Company, Limited, Manchester, with which connections have recently been established for the handling of the Hunter system in the British possessions with the exception of Canada.

Harry Hunter, president of the Hunter Dry Kiln Company and inventor of the Hunter system for processing and drying rubber will attend the exhibition in order to explain details of the system. Before returning, Mr. Hunter expects to make a special study of the drying problems of rubber industries both in England and on the continent.

Henry Tire to Be Manufactured

The Henry Tire Corporation recently incorporated for $500,000 by H. J. Fitzpatrick and C. J. Davis, has announced the removal of its offices from 5 Columbus Circle to 82 Beaver St., New York City. This concern will manufacture exclusively the Henry tire in the 30 x 3½ size and at the start will have an outlet for approximately 200 tires a day.

Personals of the Trade

Goodrich Officers Re-elected—Meurs Heads New York Branch—U. S. Rubber Officers Chosen—Wilson Stockholders Elect—Sattler Leaves Home Rubber—Ashland Chooses Heads for 1921

Goodrich Officers Re-elected

Directors of the B. F. Goodrich Co., Akron, Ohio, held a meeting recently at which time officers were elected for the ensuing year. President B. F. Work and the other officers of the company were re-elected with the exception of H. E. Raymond, vice-chairman, who resigned as

BERTRAM G. WORK

the result of retirement from business. At the annual meeting of the company, A. A. Tilney, vice-president of the Bankers Trust Co., and Harold Stanley, vice-president of the Guaranty Trust Co., were elected directors in place of A. H. Marks and A. B. Jones, resigned.

Meurs Heads New York Branch

George E. Meurs has been appointed manager of the New York export branch of the Miller Rubber Company, Akron, Ohio. He will be directly responsible to the Akron export department which is in charge of C. E. Wagner. Mr. Meurs has had a varied export experience covering a period of thirteen years in Latin-America and New York City. He is succeeding Victor Roth.

U. S. Rubber Officers Chosen

At the recent meeting of the board of directors of the United States Rubber Company the following officers, executive committee and operating counsel were elected for the ensuing year:

Col. Samuel P. Colt, chairman of the board of directors; Lester Leland, vice-chairman; Charles B. Seger, president; James B. Ford, vice-president; Homer E. Sawyer, vice-president; J. Newton Gunn, vice-president; Ernest Hopkinson, vice-president; W. G. Parsons, vice-president; Edward J. Coughlin, second vice-president; Charles J. Butler, second vice-president; George H. Mayo, second vice-president; Charles J. Butler, second vice-president, Raymond S. Willis, second vice-president; W. H. Blackwell, treasurer; Samuel Norris, secretary.

Executive Committee: Samuel P. Colt, chairman; Lester Leland, Charles B. Seger, James B. Ford, Walter S. Ballou, Nicholas F. Brady, James S. Alexander.

Operating Council: Charles B. Seger, chairman; Homer E. Sawyer, J. Newton Gunn, Ernest Hopkinson, W. G. Parsons, R. S. Willis, W. O. Cutter.

Wilson Stockholders Elect

Stockholders of the Wilson Tire & Rubber Company held an election of officers and directors April 19 in the offices of the company Springfield, Ill.

Officers elected were: president, Ralph Baker; vice-president, James McElvaine; secretary, Julius Broehl; treasurer, E. C. Broehl. Directors of the reorganized company elected at the meeting were: E. C. Broehl, Elkhart; James Serf, Detroit, Mich.; Ward Gillan, East St. Louis; Theodore Ruther, Chicago; Elmer Vaniman, Virden; Julius Broehl, Pana; James McElvaine, Chicago, and Ralph Baker of Springfield.

Sattler Leaves Howe Rubber

E. A. Sattler, more familiarly known as "Sam" in the rubber industry, has resigned as director in charge of sales of the Howe Rubber Corporation, New Brunswick, N. J. Otis R. Cook of Cleveland, Ohio, will succeed Mr. Sattler as vice-president in charge of sales, having acquired a substantial capital investment in the company.

Mr. Sattler came to New Brunswick in 1914 to take charge of sales of the Howe Rubber Corporation. Prior to this Mr. Sattler was for many years with the Diamond Rubber Co. in charge of solid tire sales at Akron and later in the East with headquarters in New York City.

Akron Men Receive Appointments

(Special Akron Correspondence)

F. E. Titus, foreign sales manager of the B. F. Goodrich Co., and David L. Brown, foreign advertising manager of the Goodyear Tire & Rubber Co. were among Akron men appointed as members of the foreign trade advisory service staff of the National Foreign Trade Council for service during the council's annual convention at Cleveland early this month.

Akron Agency in New Home

Improved business conditions have made necessary several additions to the staff of the Akron Advertising Agency Company, with a resultant demand for larger quarters. In common with other leading agencies, the company has accordingly taken a step ahead by acquiring its own building at 115 South Union St., in the residence section of Akron.

Ashland Chooses Heads for 1921

The second annual meeting of the stockholders of the Ashland Tire & Rubber Co. was held at the offices of the company Ashland, Ohio, on April 4 at which approximately 150 stockholders were present. The principal speaker at the meeting was Judge F. N. Patterson, a director of the company, who gave a general talk on business conditions and the demands for automobile tires during the coming year and prevailed upon the stockholders to purchase an additional amount of stock available so as to enable

JACOB FICKEL

the company to increase its production to take care of the additional volume of business which it has been turning down. Other speakers were G. C. Weyher, vice-president; A. A. Fickel, secretary and treasurer; W. H. Roberts, director and Jacob Fickel, president, who also put before the stockholders the financial condition of the company which is in a very healthy condition.

The stockholders unanimously elected the same directors of the company, namely: George Hildebrand, Judge F. N. Patterson, F. L. Fickel, G. C. Weyher, A. A. Fickel, W. H. Roberts, T. T. Elliott and H. C. Bate.

After the stockholders' meeting the directors' meeting was called to order for a general discussion of business relating to the company and also for the election of officers, the same officers being elected as follows: Jacob Fickel, president; G. C. Weyher, vice-president; A. A. Fickel, secretary and treasurer; W. H. Roberts, second vice-president; T. T. Elliott, assistant-treasurer and H. C. Bate, assistant secretary.

Welch Leaves Goodyear

(Special Akron Correspondence)

E. J. Welch, assistant-advertising manager of the Goodyear Tire & Rubber Co., has left Akron to take a new position with the advertising and publicity department of the Hudson Motor Car Co., of Detroit.

MARKETS

Manufactured Rubber Goods

NEW YORK, MAY 5, 1921

The rubber industry is gradually working back to normal. Indications of this are to be seen on all sides, but it has been a long way and a hard pull and all is not over yet.

Continued declines in the prices of raw materials used in the making of tires and other rubber products have aided in the process of re-adjustment. Crude rubber and raw cotton have declined about 75 per cent from their high of 1920, tire fabrics about 50 per cent, and the chemical fillers and pigments from 25 to 40 per cent. One of the outstanding price changes this month has been the cut of ½ cent per pound in the price of litharge, red lead and orange mineral by the large lead corroders, which brings the current price of these materials down an even $10 per ton.

The rubber manufacturers in Akron and other rubber centers have been gradually reducing their wage scale. Cuts in pay have ranged from 10 to 25 per cent, and there has been a weeding out of the unfit employes, in an attempt to reach the utmost efficiency. This has also helped materially toward lower prices on the finished products and the various factors are in better shape all around to meet the changed conditions of the day.

AUTOMOBILE TIRES

The tire makers have been speeding up their production this spring until it has reached from 50 to 65 per cent of the average attained last year.

The feature of the last two weeks of business has been the drastic cut of 20 per cent in the price of tires announced by the B. F. Goodrich Co. which went into effect on May 2.

This notable price revision, one of the largest in the history of the industry, was undertaken as a final step toward meeting the views of the buying public. There are indications that many of the other large tire makers will fall in line, as this is a buyer's market and the lowest price makes the market.

In the view of the company which initiated the price cut the drop in raw materials, the moderate declines in the cost of labor, and the pressure for lower prices, justified the move. Furthermore with production on the upgrade again manufacturers would be able to operate under the lower price scale at a legitimate profit.

A good deal of optimism has been noted in the tire trade of late, Col. Samuel P. Colt, of the United States Rubber Company, stating recently that "the tire trade, which it was predicted would never return, has almost reached normal and I still believe and I still predict that the number of tires used in the year 1921 will be greater than in 1920 or in 1919 or in any previous year in the history of the industry."

The anticipation of the trade is somewhat below this sanguine prophecy, but hopes for a tire year which will be close to or even slightly above normal years run high.

MECHANICAL RUBBER GOODS

Some of the largest items among the mechanical rubber products have been in poor shape this spring, while others among them being garden hose are undergoing a good seasonable demand.

The fact that the copper mining and smelting industry is virtually at a standstill together with the slowness of the large steel operators in getting under way has resulted in a stagnant market for industrial rubber products such as belting, air-brake hose and pneumatic equipments.

Whenever consumers do come into the market for supplies they do a good deal of "shopping around" for their supplies. The keen competition for the business in sight has led to considerable price-cutting. some sellers quoting down to levels where the larger factors are not anxious to meet them.

It has been reported that the railroads have been restricting their buying to almost the zero point. In the view of some producers of coupling and air-brake hoses the railroad supply shelves are pretty bare at the present time, and it has been necessary for them to switch supplies in order to meet emergencies. Some of this drastic economizing, in the view of the trade is being done for the sake of public effect," a display of economy", as one factor sarcastically commented.

One consuming trade which has exerted a comparatively better demand for packing and belting than the rest has been the building material industry. Cement makers and stone workers have been ordering belting in considerable quantity and this has been one of the bright spots in an other wise dull situation.

The situation is improved, technically, inasmuch as there is no abundance of supplies in consuming channels. Dealers are running low on their stocks, and the danger of losing part of the available business this year through too great conservatism in purchasing, it is pointed out, is more pressing than that of being caught with too large inventories. With all commodity prices as severely deflated as they have been within the last six months the chances of inventory depreciation are greatly minimized.

RUBBER FOOTWEAR

The coming season in footwear promises to be a fairly auspicious one. Auguries do not hold as well for heels as for other rubber footwear, notably white goods. The textile trade in New York is looking forward to one of the biggest white goods seasons in many years. With the dominance of white attire will inevitably come a greatly augmented demand for white shoes of canvas or buck with rubber soles and heels.

Dealers have been showing the usual lack of confidence in some instances, but on the whole they have been placing good-sized orders. Some of them, in the manufacturers' opinion, may be caught in the jam if the white goods business goes over as it is expected to. The spring season has also brought a good call for athletic footwear, and this will obviously continue straight through the summer.

In heels there is a routine business of somewhat diminished volume. Indications point to a falling off in demand for this product over the next few months, as dealers are not prone to stock up heavily on heels before the end of the summer.

DRUGGISTS' SUNDRIES

Business in druggists' sundries seems to have slackened a bit after keeping well ahead of other lines of rubber manufactures. The buying season for jobbers and dealers has been over for some time, and manufacturers are now laying plans for their fall business.

Business in hot water bottles which formed a large part of the trade has fallen off somewhat, but other sundries are keeping fairly close to normal. Prices have generally been reduced about 10 per cent from those which prevailed last year, and buyers have shown a tendency to proceed conservatively in placing their orders. But on the other hand factors in the trade pointed out that there had never been any exorbitant advance in the prices of their commodities at the height of the season last year.

MISCELLANEOUS

The current demand for rubberized clothing has shown a substantial improvement over the first two months of this year, but it is still considerably below normal. There is a fair consuming interest in raincoats and mackintoshes, at the lower scale of prices which prevails at the present time. Most producers have revised their quotations downward from 15 to 33 per cent according to the different articles.

There is hand-to-mouth buying in automobile specialties, but other hard rubber specialties are going quite well.

Cottons, Yarns and Fabrics

NEW YORK, MAY 6, 1921

The dominant view of the cotton situation, in New York, has been that the market is lacking in the potential strength necessary to a sustained advance. For two months past the market has tried to climb and has slipped back.

During the last week, there has been a sharp advance of 30 to 46 points in the price of May, July and October, but on the followinf day there were sufficient offerings to offset the short covering movement and values reacted to about the same levels occupied previous to the bulge. The fundamental conditions were unchanged and the cotton market continued to fluctuate fractionally in accordance with outside conditions.

Reports on the new crop generally agree that there will be a considerable curtailment in the acreage. The most reliable estimates have narrowed down to a reduction of from 28.2 per cent to 31 per cent.

Foreign developments have not been encouraging. Adverse Liverpool cables and light buying by the United Kingdom during the industrial crisis have constantly offset the strengthening movement in the domestic market.

May cotton ruled at 12.62 to 12.65, July ranged from 13.07 to 13.10, while October ranged from 13.74 to 13.78. Middling spot cotton was fairly steady with sales light at 12.90 as the ruling quotation.

The most important factor in the situation has been the abundant supply carried over from the previous crop. There has been very little export demand to remove this surplus, and domestic mills are not inclined to buy raw materials except at concessions. In the next two months or so, news of the weather in the cotton belt and the progress of the crop will play the largest part in determining the course of the market.

PREMIUM STAPLE COTTON

The market for premium staple cotton has remained featureless and inactive owing to the absence of demand from tire makers. According to persons well posted on the trade, there is nothing likely to be doing for at least the next two or three months. Some mills are resuming, but the stock on hand is figured, at the extreme, to be enough for them to operate on for the next six months, and conservatively at something not far short of that. Quotations are purely nominal, middling, 1 3/16 inch is quoted at about 20 cents, New England mills, and about 18 to 19 cents in New Orleans. The 1¼ inch variety rules at 25 to 26 cents, New England mills, with prices one to two cents lower at Southern points.

There has been practically nothing doing in Sea Islands, and the Savannah market has ruled nominally at 45 cents, with buying demand stagnant. There have been so few bids recently that any considerable buying movement might give the market an entirely different aspect.

EGYPTIAN COTTON

The maket for Egyptian cotton has gone lower owing to the threatened tariff legislation which may add a duty of 7 cents per pound on all imports of this commodity. For this reason consumers in this country have been very backward about making commitments for future deliveries and have evinced more interest in Arizona.

Stocks in this country remain heavy, and private estimates made by competent authorities place the available supply at 120,000 bales. Fully good fair has recovered from its extreme low of last month, when it was quoted at 25 to 26 cents. But lately, despite the fact that the British Government has been buying in stocks in order to support the market, prices have dropped off to a nominal level of 32 to 32½ cents for fully good fair, Sakellaridis, prompt delivery, and to 35 to 36 cents per pound for fully good, prompt delivery. Buying has been stagnant, except for a few small spot orders from the fine goods trade and the thread trades. As to the 1921 crop, climatic conditions are reported to have improved, in reecnt advices from Alexandria, and the British government has ordered a curtailment in the planting of 25 per cent.

ARIZONA-EGYPTIAN COTTON

There has been a somewhat better consuming interest in Arizona cotton shown by spinners who are counting on the tariff legislation which may put a premium on foreign Egyptians. Of course the market has been a nominal affair, with prices generally at the mercy of the buyer. In view of the drastic declines which have taken place in this market a campaign to curtail the Arizona-Egyptian crop in this country was to be expected. The production last year was 75,000 bales, and the carry-over has been unusually large.

The last fortnight has seen a decided improvement in the spot demand, and a moderate advance in prices, owing to the protective tariff agaist foreign cottons, which is now imminent. Pima grade of American Egyptian cotton was offered at 35 cents per pound for the No. 2 grade, and 34 cents per pound for the No. 1. The farmers have continued to hold back their cotton for better prices, and offerings in the market have not been extensive.

TIRE FABRICS

There has been a better feeling with respect to tire fabrics during the past month, and in the last week or so buyers have been entering the market more frequently than at any time this year. Tire makers had been proceeding on the stocks they had accumulated from last year's purchases, but recently some of the smaller factors have been running low, and in making inquiries for tire fabrics have found prices stronger and have experienced much difficulty in securing the concessions and the distressed lots that were characteristic of the earlier weeks of this year.

One of the largest manufacturers of fabrics has announced a somewhat higher scale of prices, quoting Egyptian combed at 83 cents and Egyptian carded at 75 cents, with the market for the most part 3 to 5 cents lower than his quotations. Carded peelers also showed a range of from 50 to 55 cents, with combed peelers nominal, and very little doing in Sea Islands.

The factor who advanced his prices claimed that he was not anxious to contract for much new business at prevailing low prices, and that other manufacturers have been feeling the same way about it. Current prices today are down about 50 per cent from their peak last year.

HOSE AND BELTING FABRICS

There were further declines in the values of hose and belting fabrics, which reached new low levels during the past fortnight. Sellers, however, were firmer in their price ideas and the downward trend was not as conspicuous as formerly.

Single filling ducks fell off one cent, offerings ruling at 11 to 13 cents; enameling ducks were quoted down to 28 to 30 cents, while shoe ducks declined similarly to a flat quotation of 35 cents. The weakness of the market has been ascribed to the constant liquidation of supplies by second hands, while rubber manufacturers are overstocked and have been doing practically no buying whatsoever.

Quotations on belting ducks were nominal and unchanged at 28 cents per pound, with hose ducks at 30 cents, but it was rumored that there were distressed offerings at as low as 25 cents for belting ducks. There has been very little doing in these lines, except for more frequent shipping instructions from some of the large rubber companies who have been long on stocks for many months.

DRILLS, SHEETINGS, AND OSNABURGS

Converters have shown more interest in drills and sheetings, especially the lightweight sheetings, but the rubber trade has been consistently out of the market. There were further declines of from ¾ cents to 2¾ cents per yard in the various grades of sheetings. The market was still depressed, as the volume of transactions has been extremely low this season. However, with prices deflated to about 33 per cent of their proportions at this time in 1920, producers are firmer in their price ideas and are very reluctant to make concessions.

The rubber people are believed to have ample supplies in stock, and factors in this trade are not very optimistic about rubber buying.

Osnaburgs underwent fractional declines, but were a little stronger than sheetings. Osnaburg, 30-inch, 7-ounce were quoted dominantly at 7 cents per yard, with the 40-inch at 9 cents.

The burlap market has been extremely dull, with all quotations more or less nominal, so that a firm bid usually gained sizeable concessions. Most of the

weakness has been apparent in the heavy-weight burlaps while the light-weights have been comparatively scarce on the spot. There were moderate declines of from 10 to 20 points, with the 7-ounce 40-inch quoted at 3.85 cents per pound, carload lots, f.o.b. New York, and the 10-ounce, 40-inch at 4.15 cents per pound.

TIRE FABRICS

17¼-ounce Sea Island, combed, sq. yd.	Nominal		
17¼-ounce Egyptian, combed	.80	@	.83
17¼-ounce Egyptian, carded	.70	@	.75
17¼-ounce Peelers, carded	.50	@	.55
17¼-ounce Peelers, combed	Nominal		

DUCKS

Belting (pound basis) lb.	.28	@	—
Hose (pound basis) lb.	.30	@	—
*Enameling lb.	.28	@	.30
Shoe Ducks lb.	35	@	—
Single filling yd.	.11	@	.13
Double filling yd.	.14½	@	.13

*Price varies according to width.

DRILLS

37-inch	3.25-yard	yd.	.07¼	@	—
37-inch	2.75-yard	yd.	.08½	@	—
37-inch	3.00-yard	yd.	.08	@	—
37-inch	3.50-yard	yd.	.07	@	—
37-inch	3.95-yard	yd.	.06	@	—

OSNABURGS

30-inch	7-ounce		.07	@	—
40-inch	7-ounce		.09	@	—

SHEETINGS

40-inch	2.35-yard	yd.	.10	@	—
40-inch	2.50-yard	yd.	.09¼	@	—
40-inch	2.85-yard	yd.	.08	@	—
40-inch	3.15-yard	yd.	.09⅜	@	—
40-inch	3.60-yard	yd.	.07⅝	@	—
40-inch	3.75-yard	yd.	.06¾	@	—
40-inch	4.25-yard	yd.	.06	@	—

Note—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS
(Carload Lots)

7-ounce	40-inch	lb.	3.85	@	——
7½-ounce	40-inch		3.85	@	——
7½-ounce	45-inch		4.35	@	——
8-ounce	40-inch		3.90	@	——
8½-ounce	40-inch		4.15	@	——
10-ounce	36-inch		4.15	@	——
10-ounce	40-inch		4.00	@	——
10-ounce	45-inch		5.00	@	——
10½-ounce	40-inch		4.20	@	——

Chemicals and Compounding Materials

NEW YORK, MAY 6, 1921

The outstanding price changes of the past two weeks have been the cuts in quotations on dry red lead, litharge, and orange mineral. These commodities were reduced in price by ½ a cent per pound, in wooden barrels, the price in steel kegs remaining unaltered.

The notable thing about the reductions in these lead pigments was that the large lead corrpders had resisted pressure for lower prices ever since January1, of this year, when the last revisions had been made. Prices at that time were guaranteed up to June 1, and around that time, changes all along the list are expected to take place, in white lead, sublimed lead and red lead.

Producers of heavy chemicals have felt severely the drastic curtailment of demand from tire makers and rubber manufacturers generally. The market for barytes and blanc fixe have been practically dead. Both litharge and zinc oxide have seen operations greatly curtailed, possibly 60 per cent or more. Prices of the various grades of whiting have been hammered down to lower levels, as a result of the influx of foreign whiting.

The dry color market has been unsettled. In the chemical colors prices have dropped so low that there has been a strong effort made to at least hold them up. The earth colors, which are mostly used by the tire trade and the rubber manufacturers have been steadier, and are largely in strong hands. However, there are still odd lots in the market at prices which represent considerable concessions below ruling quotations by the leading factors.

IMPORTS AND EXPORTS

During the past month shipments of crude chemicals from Germany and Europe have been on the upgrade. Most of these had been contracted for before the foreign political situation became overcast.

About 80 barrels of lithopone arrived recently in the Port of New York, and the c.i.f. New York price was said to be from ¾ of a cent to 1 cent per pound lower than domestic quotations. Producers here declared, however, that the rate of importation was still far below that of normal years when the average aggregated 3,500 tons or roughly 150 barrels per month. There have been considerable importations of whiting and clays. In the dry colors, importations have been more infrequent, owing to the dull buying interest in these articles. Some odd lots of red oxides, were shipped to New York dealers recently, but the oxide reds were generally scarce.

BARIUM PRODUCTS

The market for blanc fixe has been stagnant for the greater part of this year. Dry blanc fixe ruled at 4¼ cents per pound, car lots, f.o.b. works, a decline of ¼ cent per pound, or $5 per ton. It was intimated that on firm bids the buyers might work the quotation down to a flat 4 cents per pound, or $80 per ton, as the market has been glutted with supplies. All of the large producers have kept their plants shut down since the beginning of this year. Barytes have been equally dull, although somewhat more firmly held. Quotations were $24.50 to 26.50 per ton for Western, prime white, f.o.b. mines, packages extra.

DRY COLORS

Prices of mineral colors were steady for the most part and in the case of the pure oxide Indian reds, a large item for the rubber trade, there was an advance of ½ a cent in the spot market, current quotations holding to a basis of 13½ to 16 cents per pound in car lots. The strengthening of the market was due to the disturbed conditions overseas which have resulted in delaying shipments of these commodities.

Copperas reds were firm on the spot at 13 to 16 cents per pound, but the presence of keen competition for the business in sight weakened the market slightly. The rubber trade has been out of the market for a long time, and purchases from this source have been only nibbles.

In the chemical dry colors, the iron blues, were stronger, as a result of an advance in the importers' quotations. Domestics were held at 60 cents, unchanged. The chrome yellows, at the low price of 21 cents per pound have shown no tendency to go lower, and there was a good amount of covering for future needs.

LEAD PIGMENTS

The large lead corroders initiated the first price change in these products since January 1 of this year. Dry red lead, in barrels, was cut ½ a cent to a basis of 8¾ cents per pound. The price of litharge was reduced similarly to a basis of 8¼ to 8½ cents per pound. Orange mineral was also reduced ½ a cent per pound. These changes had been anticipated by the trade for a long time. Quotations on sublimed blue lead, white lead (both carbonate and sulphate) were unchanged. Producers of lead pigments have been curtailing their output this season, and have had difficulty in moving their stocks, except in the direction of the paint trade.

LITHOPONE

Lithopone has been going very well this spring. Producers have been turning out good tonnages and disposing of them very freely. Of late there has been a small resumption of buying by the rubber trade. One of the largest manufacturers of lithopone reported that some of the smaller tire makers had been buying good quantities of lithopone during the past two weeks, and using it profitably. Prices were firm at 7 cents per pound in in bags, and 7¼ cents in barrels.

TALCS AND CLAYS

There were ample supplies of English china clay in the spot market, with very little buying interest in sight. The market was a nominal affair, and although quotations were $10 to 12 per ton for domestic lump, and $16 to 25 per ton for imported china clay, it was intimated that better terms could be secured on firm bids for carlots quantities. There have been reports that tire makers have been substituting china clay for zinc oxide to some extent.

The talc market has been very weak, and quotations on American, were $18 to 20 per ton, with French, low grade, quoted at $22.50. There has been some buying interest in the high grade French and Italian tales which run from $45 to $60 per ton.

WHITING

Prices declined from 10 cents per cwt. in all grades of pure whiting owing to the continued backwardness of demand and competition by foreign producers and by-product whitings. Commercial whiting was quoted down to $1.15 to 1.20 per 100 pounds, Paris white, $1.40 to 1.50, and English cliffstone, $1.65 to 1.75.

ZINC OXIDE

Although tire manufacturers have had such large stocks of zinc oxide on hand that they have been out of the market

for many months, there have been indications of renewed demand from this quarter within the past two or three weeks. The supply of distressed lots which was very formidable some time ago has been practically cleaned out by now, and consumers have found it necessary to go to first hands for supplies. Producers now seem to have the situation well in hand and although the volume of transactions is still far below normal there have been some good tonnages passed into consuming channels recently which have reduced their surplus stocks. Quotations have been firm and unchanged.

CRUDES

Benzol, 90 per cent, was quoted down to 24 to 28 cents by some factors, while the pure benzol was scarce and firmer at quotations ranging from 31 to 33 cents. Phenol has held steadily to 10½ cents per pound, but the undertone has been weak, as liquidation lots were offered at the buyer's terms practically. Formaldehyde dropped a half cent during the fortnight being quoted at 14½ to 16 cents per pound.

INDUSTRIALS

The market for carbon tetrachloride ruled at 12 to 12½ cents per pound and an active demand has been reported. There were still more second hands offering at 10 cents. Stocks of carbon bisulphide moved very briskly under active buying and prices were firm at 6 to 7½ cents per pound. The demand for antimony has also picked up within the past few weeks, but until there has been some absorption of the surplus stocks now held by the rubber trade, there can be no chances of recovery from the low prices prevailing.

INTERMEDIATES

Domestic aniline oil was quoted at 20 cents and has shown no tendency to go lower. But aniline oil has been quoted for shipment from Japan at 18 cents. Anthracene has been extremely dull and has fallen off 10 cents to a basis of 75 to 85 cents per pound. Dymethyaniline has been steady at 45 to 50 cents per pound, with the outside quotation 5 cents lower.

Current Prices for Chemicals, Fillers, Colors, etc.

Acetone, car lots ..... lb.	.12	@	—
Acetanilid, C. P., bbls. .. lb.	.22	@	.27
Acetone smaller lots ..... lb.	.13	@	—
Acids, Acetic, 56 per cwt. ...	4.75	@	4.90
Carbolic, C. P. ..... lb	.09	@	.12
Muriatic, 20 deg. .cwt.	1.50	@	1.75
Muriatic, 22 deg. .. cwt.	2.00	@	2.75
Nitric, 40 deg. .... cwt.	6.25	@	7.00
Nitric, 42 deg. .... cwt.	7.00	@	7.50
Sulphuric, 60 deg. car lots ..... ton	12.00	@	13.00
Sulphuric, 60 deg. car boys	19.00	@	21.00
Tartaric, crystals .. lb.	.39	@	—
Albalith	.07	@	.07½
Aluminum Flake, sacks, .ton	.27	@	—
barrels, ... ton	.33	@	—
Aluminum Silicate	Nominal		
Aniline oil, bulk basis			
Contract	.19	@	—
Imported	.18	@	—
Domestic	.20	@	—
Antimony—			
Oxide ..... lb.	.07	@	.09
Sulphuret, red ..... lb.	.25	@	.28
Sulphuret, golden .. lb.	.25	@	.30
Sulphuret, crimson .lb.	.40	@	.46
Alcohol, denatured, 190 proof	.38	@	.40
Wood, 95 per cent	.77	@	—
Ethyl, 190 proof	4.80	@	4.90
Aldehyde, Ammonia	Nominal		
Ammonia, powdered	.08	@	.10
Ammonium Carbonate, domestic ..... lb.	.08	@	.10
Amyl Acetate ..... gal.	3.05	@	3.10
Anthracene, 80 per cent ..	.75	@	.90
Anthroquinine, 95 per cent .	1.75	@	2.00
Asbestine ..... r.	Nominal		
Asphaltum, Egyptian .... lb.	.20	@	.25
Domestic ..... ton	35.00	@	40.00
Barium, dust ..... lb.	.05½	@	—
Barytes, prime white imported	30.00	@	45.00
Southern, off-color, f. o. b. mills	16.50	@	18.00
Western, prime white, f. o. b. mills	24.50	@	—
Beeswax	.43	@	.47
Benzidine Base ..... lb.	.85	@	1.10
Benzol, 90 per cent	.24	@	.28
Benzol, pure bulk, 100	.31	@	.33
Blanc Fixe, dry bbls. .... lb.	.04¼	@	—
Burgundy Pitch, dom. ... lb.	.04	@	.04½
Foreign	.60	@	.65
Blacks, Drop ..... lb.	.08	@	.11½
Ivory ..... lb.	.11½	@	.45
Carbon, gas, cases ... lb.	.10½	@	.20
Lampblack, R. M. ..... lb.	.17	@	.18
Mineral blacks .... ton	30.00	@	40.00
Blues, Prussian ..... lb.	.60	@	—
Soluble ..... lb.	.60	@	—
Ultramarine ..... lb.	.10	@	.35
Browns, Umber, Turkey, burnt powdered ..... lb.	.05¼	@	.05½
American, burnt .... lb.	.04¼	@	.06½
Cadmium, sulphide, yellow lb.	1.20	@	1.30
Carbon, Bisulphide, bulk .lb.	.06	@	.07½
Tetrachloride ..... lb.	.12	@	.12½
Casein, C. P. ..... lb.	.45	@	.48
Castor Oil	.07¾	@	.11
Caustic Soda, 76 per ct. cwt.	3.70	@	3.75
Chalk, precipated, extra light	.02¾	@	.03¼
heavy ..... lb.	02¼	@	.02½
China clay, domestic lump ton	10.00	@	12.00
imported ..... ton	16.00	@	25.00
China Wood Oil, bbl. .... lb.	.09¼	@	.09¼
F. o. b. Pacific Coast ..	.08¼	@	—
Chloroform, U. S. P.	.40	@	.43
Clay, Dixie ..... ton	22.00	@	35.00
Blue Ridge ..... ton	22.00	@	35.00
Coal Tar Pitch	22.00	@	—
Cottonseed Oil, crude, f. o. b. mills ..... lb.	5.25	@	—
Prime summer yellow .	6.10	@	—
Dimethylaniline ..... lb.	.45	@	.50
Elateron	—	@	—
Formaldehyde, spot ..... lb.	.14½	@	.16
Fullers Earth, powd., carload lots.....	22.00	@	—
Fossil flour ..... ton	60.00	@	—
Genasco Mineral Rubber ton	50.00	@	52.00
Gilsonite ..... ton	60.00	@	65.00
Glue, extra white ..... lb.	.30	@	.40
medium ..... lb.	.25	@	.30
low grade	.17	@	.19
foot stock	.16	@	.20
brown foots	.16	@	.22
common bone	.13	@	.19
Glycerine, C. P. (drums) lb.	.17	@	.17½
cans	.18½	@	.19
Graphite, flake (bbl.) .... lb.	.14	@	.20
powdered (bbl.) .... lb.	.04	@	.10
Green, chrome, R. M. .. lb.	.36	@	.58
Ground glass (fine) ..... lb.	.03½	@	.04
Hexamethylene ..... lb.	1.15	@	1.20
Hexamethyenetramine ... lb.	.90	@	.95
Infusorial earth, powd'd.. lb.	.02	@	.035
bolted ..... lb.	.035	@	—
Iron oxide, red reduced grades	.04	@	.05½
red, pure, bright .... lb.	.13	@	.16
Kaolin	.07	@	.10
Lime, hydrated	—	@	—
Lead, red dry (casks) ... lb.	.08¾	@	.09
sublimed, blue ..... lb.	.07¼	@	.07½
White, basic carb	.07½	@	.08
white, basic sulp. ... lb.	.07¼	@	.07½
Lime flour ..... lb.	.02½	@	—
Litharge (casks) ..... lb.	.08¼	@	.08½
English ..... lb.	—	@	—
Lithopone, domestic, bbls. lb	.07¼	@	—
in bags ..... lb.	.07	@	—
M. R. X.	—	@	—
Magnesia, carbonate ..... lb.	.15	@	.17
Magnesite, calcined, pwd. ton	50.00	@	65.00
Magnesia, Oxide, heavy	.05¾	@	—
Light	.35	@	—
Napthalene ..... lb.	.08	@	.11
Nitrobenzol	.12	@	.14
Naphtha, motor gasoline, (steel bbls.) ..... gal.	.25	@	.28
68 @ 70 degrees (steel bbls.) ..... gal.	.35	@	.35½
70 @ 72 degrees (steel bbls.) ..... gal.	.36½	@	—
73 @ 76 degrees (steel bbls.) ..... gal.	.37½	@	.38½
machine (steel bbls.) gal	.26	@	.28
Oil, corn, crude factory cwt.	7.76	@	—
corn, ref. (bbls.) ..cwt.	9.76	@	—
linseed, (bbls.)	.63	@	—
In carloads, spot	.58	@	.60
Tank cars	.51	@	.53
Oil Palm, Lagos ..... lb.	.06¾	@	—
Niger	.05¾	@	—
Pine, yellow ..... gal.	1.35	@	1.40
Distilled ..... gal.	.05¾	@	—
Rapeseed, refined ..gal.	.86	@	—
Rapeseed, blown ..gal.	.86	@	—
Rosin, first rectified gal.	.40	@	.43
Second, run	.45	@	.48
Tar (commercial) ..gal.	.35	@	—
Oleum Acid, 20 per ct. ton	22.00	@	24.00
Orange mineral, Amer. ..lb.	.12¼	@	.14
Imported, German ..lb.	.18⅝	@	—
Ozokerite	Nominal		
Paraphenylenediamine .... lb.	2.00	@	2.25
Petrolatum, bbls., amber .lb.	.06½	@	—
Pale yellow ..... lb.	.05½	@	—
Paraffin, refined, 118 @ 120 m. p.	—	@	—
127 @ 129 m. p.....	.09¾	@	.10¼
137 @ 140 m. p.	—	@	—
Phenol	.10½	@	.16
Pumice	.03	@	.08
Pine tar kiln ..... bbl.	13.00	@	—
Pitch ..... bbl.	7.50	@	—
Plaster of paris ..... bbl.	4.25	@	5.00
Red Tuscan ..... lb.	.17½	@	.35
Red (American) .... lb.	.08	@	.10
Indian (English)	.13½	@	.16
Rosin (common to good)— 280 lbs.	5.30	@	—
Rotten stone, powdered .. lb.	.02½	@	.04½
Rubber, substitute, black lb.	.08	@	.16
White ..... lb.	.10	@	.18
Brown ..... lb.	.12	@	.17
Mineral, Hard Hydrocarbon ..... ton	35.00	@	45.00
Soda Ash, light 58 pct. cwt.	1.90	@	2.00
Sodium Nitrite 96 @ 98 pct.	.06	@	.10
Solvent naptha, crude, hvy.	.25	@	.28
Soya Bean Oil, bbls. .... lb.	.07	@	—
Sellers, tanks, f. o. b. Coast	.04½	@	—
Stearic Acid, single	.10	@	—
Shellac, fine orange ..... lb.	.56	@	.57
Shellac T. N. ..... lb.	.45	@	.46
Bleached, ordinary .. lb.	.45	@	.46
Bleached, bonedry .. lb.	.55	@	.58
Silex (silicia) ..... ton	12.00	@	35.00
Soapstone, powdered ... ton	15.00	@	20.00
Starch, corn, powd. ..cwt.	2.68	@	3.16
French ..... ton	22.50	@	30.00
Jap potato, duty pd. lb.	.05	@	.05½
Sulphur Chloride, drums...	.06½	@	.16
Sulphur, crude..... ton	—	@	—
100 pounds.....	—	@	—
Roll	2.00	@	2.60
Commercial superfine ..	2.00	@	2.90
Talc, American..... ton	18.00	@	20.00
French ..... ton	22.50	@	30.00
Thiocarbanilid	.65	@	.70
Tolulol, pure, in drums, gal.	.27	@	.32
Commercial	.30	@	.32
Tripolite earth..... lb.	.01½	@	—
Turpentine, pure gum— Spirit ..... gal.	.75	@	.80
Wood ..... gal.	.65	@	—
Venice, artificial..... gal.	.15	@	.18
True	2.20	@	2.25
Vermillion, English ..... lb.	.90	@	1.10
American	.25	@	.30
Vorite Rubber Substitute— "Soft"	.14	@	—
"A"	.14½	@	—
"C"	.14½	@	—
"Special"	.14½	@	—
Wax, beeswax, crude, yel. lb.	.21	@	.22
Refined	.24	@	.25
Bayberry	.25	@	.26
Ceresin, white ..... lb.	.13	@	.14
Yellow	.12½	@	.13
Whiting, commercial .... cwt.	1.15	@	1.20
Gliders Bolted	1.20	@	1.30
Paris, white Amer. cwt.	1.40	@	1.50
English, cliffstone ..cwt.	1.65	@	1.75
Quaker ..... ton	13.00	@	15.00
Xylol (gal) pure	.40	@	.43
Commercial	.28	@	.35
Zinc Oxide, French process Red Seal	.10	@	.10½
Green Seal	.11	@	.11½
White Seal	.12¼	@	.12½
Leaded Grades— Commercial, lead free .	.08¾	@	.09¾
5 per ct. lead sulphate..	.08	@	.08½
10 per ct. lead sulphate	.07⅞	@	.08⅝
20 per ct. lead sulphate	.07¾	@	.08½
35 per ct. lead sulphate	.07⅝	@	.08⅛
Zinc Sulphate	.03¼	@	.03½

Crude Rubber

NEW YORK, MAY 5, 1921

The tendency of prices during the last period has been toward slightly higher levels. Closing quotations on spot ribbed smoked sheets were 16¾ cents per pound, while bids held to 16½ cents. At this there were very few offerings on the market, which presented a firmer aspect under more favorable buying by tire operatives.

In the previous week the sharpest drop of the month occurred, when ribbed smoked, spot was quoted down to 15½ cents. This was due to one dealer's engaging in heavy liquidation. The better potential strength of the rubber market was indicated by its recovery from the lower levels in subsequent trading.

Transactions in both plantations and Paras have taken place within a somewhat broader range during the past fortnight. Of course the plantations have been the big item, and there have been more tire manufacturers in the market recently than has usually been the case this spring. Interest has centered in spot and nearby positions. Beyond July there is very little buying interest. There were some speculative inquiries made by dealers for December ribbed smoked sheets, one importer reported, with a bid of 20 cents, which no one took seriously.

The October-December position was 3 cents stronger than as given in our last report on first latex crepe and the same deliveries for smoked ribbed sheets have also advanced 3 cents. But in the spot position for both grades the net upward change has not been more than ½ cent per pound, and the market is such a sensitive affair just now that any precipitated buying or selling movement may radically alter the whole situation.

There was very little buying interest evinced in Centrals and Africans, and prices were nominal and unchanged, and there was very little doing in Balata.

Arrivals of shipments of clean thin brown crepe in the Port of New York aroused some interest in this grade, in the last week, and prices were up ½ cent per pound

Advices from the Far East have been uniformly dull, cabled quotations being such as to merely feel out the domestic market. The London market reports fractional fluctuations, with a general upward tendency. The highest point touched in April according to recent mail advices was 11¾d for April delivery Standard crepe, and 10¾d for ribbed smoked sheets. The continuance of the coal strike and the threatened spread of labor troubles tended to restrict business greatly and closing values were ½d below the top figures quoted. At the close the London market was quiet and slightly easier.

Ceylons			
Smoked sheets, ribber, spot	.16½	@	.16¾
July-Sept. sheets	.17½	@	.18
Oct.-Dec. sheets	.22½	@	—
Smoked sheet plain, spot	.14½	@	.15
First latex pale crepe	.18½	@	.19
July-Sept. latex	.21	@	—
Oct.-Dec. latex	.22	@	.22½
Amber crepe, No. 1	.15½	@	—
Amber crepe, No. 2	.14½	@	—
Amber crepe, No. 3	.13½	@	—
Clean brown crepe	.14½	@	—
Light clean brown crepe	.14	@	.14½
Roll brown crepe	.11	@	.11½
Grand Central crepe	.12½	@	—
Africans			
Loando Niggers	.08	@	—
*No. 1 Benguella	.08	@	—
*No. 2 Benguella	.07	@	—
Lapori Ball	—	@	—
Paras			
Up-river fine	.17¾	@	—
Up-river medium	.15	@	—
Up-river coarse	.08½	@	—
Islands fine	.18	@	—
Islands coarse	.10½	@	—
*Madeira fine	.21	@	—
Cameta	.11	@	—
Centrals			
Corinto prime	.10½	@	.10¾
Esmerelda prime	.11½	@	—
Miscellaneous			
Guayule wet	.15	@	.18
*Balata block Panama	.34	@	—
Balata sheets	Nominal		
Palembang	.06¾	@	—
Bangermassin	.06¼	@	—
Columbian Block Balata	.43	@	—
Prime Pontianac	.06¼	@	—

*Nominal

Scrap Rubber

NEW YORK, MAY 5, 1921

The reclaimed rubber situation has remained stagnant, as far as actual business was concerned. The better feeling in the crude rubber market and the possibility of material advances there may mean better things for scrap rubber.

With the situation as it shapes itself today, the cheapness of crude rubber makes it impossible for reclaimers to compete with the fresh material, and the large consumers who might have found it advantageous to purchase stocks of reclaimed rubber are using crude instead.

Prices have been nominal and subject to the buyer's conscience, or the sellers' pressure to liquidate his stocks into ready cash. Quotations by leading sellers of scrap for prompt shipment materials were as follows:—

	Cents per Pound		
Solid Tires	1.50	@	2.00
Auto Tire Peelings	2.25	@	2.50
Truck Tires	1.00	@	1.75
Black Rubber	1.50	@	2.00
Boots and Shoes	2.25	@	—
Arctics, trimmed	2.00	@	3.00
Arctics, untrimmed	—	@	—
Tire—Automobile	.50	@	.75
Bicycles, pneumatic	.50	@	.75
Mixed Hose	.50	@	.75
Air Brake	1.00	@	—
Inner Tubes No. 1	6.50	@	7.00
Inner Tubes No. 2	3.50	@	4.00
Red Tubes	2.50	@	4.00

Akron Stock Prices

(Special Akron Correspondence)

Gradual improvement in the rubber industry throughout the Akron district is reflected in the stock market. Quotations are generally higher for May over the last half of April.

Goodyear common which broke to 8¼ following announcement of details of refinancing and reorganizing has climbed back to 10 and shows signs of going higher. Goodyear preferred is back to 34. The new Goodyear 8 per cent bonds also are on the local market and are bringing a fraction over 101. These bonds were first offered at 99 and the issue was over-subscribed before the brokers had a chance to get their advertisements in the newspapers in this locality.

Passing of the dividend on common did not affect the value of Goodrich shares in the opinion of investors. Goodrich common is now above the 40 mark for the first time in months and is continuing to show decided strength.

Following are the quotations on May 2:

	Bid	Asked
Amer. R. & T. com	42	50
do pfd	..	90
Amazon Rubber	..	40
Firestone T. & R. com	75	85
do 6 pct. pfd.	86	90
do 7 pct. pfd.	74	76
General T. & R. com	190	300
do 7 pct. pfd.	75	85
B. F. Goodrich com	40½	41½
do 7 pct. pfd.	77	80
do 5 yr. 7 pct. notes	89½	90½
Goodyear T. & R. com	10½	11
do 7 pct. pfd.	33½	34½
Goodyear 8's	101	101½
India Rubber com	..	105
do 8 pct. pfd.	..	85
Mason T. & R. com	18¼	20
do 7 pct. pfd.	58	60
Marathon T. & R. com	3½	4
Miller Rubber com	..	75
do 8 pct. pfd.	72	75
Mohawk Rubber com	110	115
Portage Rubber com	18	23
do 7 pct. pfd.	34	36
Republic Rubber com	½	⅞
do 7 pct. pfd.	..	14
do 8 pct. pfd.	8	10½
Rubber Products	..	60
Star Rubber com	..	100
do 8 pct. pfd.	..	100
Swinehart T. & R. com	..	40
do 7 pct. pfd.	..	70
Phoenix Rub. com	..	20
do pfd.	..	90
Standard Tire com	..	125
do pfd.	..	90

New York Stock Prices

Following are the New York Stock Exchange quotations on the various rubber stocks listed for May 4:

Ajax Rubber	37	37½
Fisk Rubber Co.	17⅝	18
B. F. Goodrich Co.	41⅛	41½
do pfd	82	83½
Kelley-Springfield Tire Co.	53⅛	53⅝
do 8 per cent pfd	85½	90
Keystone Tire	..	..
Lee Rubber & Tire Co.	28	28½
U. S. Rubber Co.	77½	77⅝
do 1st pfd	104¼	101⅝

American Rubber Patents

ISSUED APRIL 12, 1921

1,374,231—To Joseph Porzel, Buffalo, N. Y., assignor to Superior Rubber Co., Pittsburg, Pa. Process of treating rubber.

1,374,371—To Wade H. Foster, Bad Axe, Mich. Footwear vulcanizer.

1,374,382—To Robert W. Mellor, Girard, Ohio. Air-chill for vehicle-tires.

1,374,390—To George W. Rode, Jr. Vehicle-tire.

1,374,480—To Lyman A. Trull, Williamsport, Pa., assignor to Lycoming Rubber Co. Vulcanized boot and shoe.

1,374,570—To Andrew Huetter, Dayton, Ohio, assignor to the Allsteel Ridewell Tire & Rubber Co., Dayton, Ohio. Air bag for vehicle-tires.

1,374,634—To George C. Card, Columbus, Ohio, assignor to the Columbus Climax Rubber Co., Columbus, Ohio. Tire-tube.

1,374,637—To De Leon Davis, Richmond, Va., assignor to the Unity Tire & Mfg. Co. Tire.

1,374,651—To James B. Hanley, Philadelphia, Pa. Resilient vehicle-wheel.

1,374,753—To Austin A. Mendenhall, Duluth, Minn. Cushioned wheel.

1,374,805—To Harold G. Ballou, Los Angeles, Cal. Process and mold for rebuilding tires.

1,374,846—To Frederick D. Goodlake, West Palm Beach, Fla. Repairing tire-casings.